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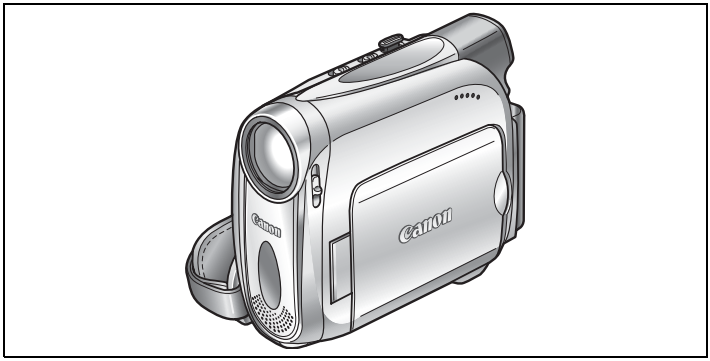
Canon

Digital Video Camcorder

Instruction Manual

English

MV960/MV950/ MV940/MV930

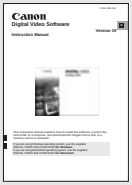


Mini DV Digital Video Cassette

PictBridge

Please read also the following instruction manual (electronic version on PDF file). For further details refer to the installation guide.

- Digital Video Software



Introduction
Basic Functions
Advanced Functions
Editing
Using a Memory Card
Direct Printing
Transferring Images
Additional Information

PAL

Important Usage Instructions

WARNING!



TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK) NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

WARNING!



TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.

CAUTION:

TO REDUCE THE RISK OF ELECTRIC SHOCK AND TO REDUCE ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

CAUTION:

DISCONNECT THE MAINS PLUG FROM THE SUPPLY SOCKET WHEN NOT IN USE.

CA-570 identification plate is located on the bottom.

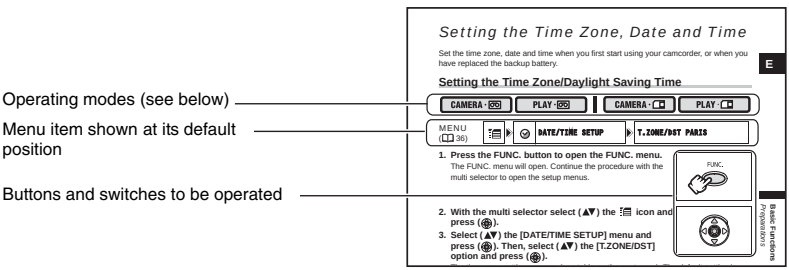
Using this Manual

Thank you for purchasing the Canon MV960/MV950/MV940/MV930. Please read this manual carefully before you use the camcorder and retain it for future reference. Should your camcorder fail to operate correctly, refer to the *Troubleshooting* table (🕮 119).

Change the display language before you begin (🕮66).

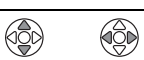
Symbols and References Used in This Manual

- ⚠ : Precautions related to the camcorder operation.
- ✎ : Additional topics that complement the basic operating procedures.
- 🕮 : Reference page number.
- **MV960** : Option or feature that applies or is available only with this model.
- Capital letters are used to refer to buttons on the camcorder or the wireless controller.
- [] are used to refer to menu items displayed on the screen.
- "Screen" refers to the LCD and the viewfinder screen.
- Please note that the illustrations mainly refer to the **MV960**.



About the Joystick and the Joystick Guide

The mini joystick allows you to control many of the camcorder's operations and to select and change setting options in menus.

	Push the joystick up, down, left or right (▲▼, ◀▶) to select an item or change settings.
	Press the joystick itself () to save the settings or confirm an action.

The functions assigned to the joystick change according to the operation mode. You can display the joystick guide to remind you of the joystick's functions in each operating mode.

Recording movies:	Playing back movies:	Recording still images:	Playing back still images:
			

About the Operating Modes

The operating modes are determined by the position of the POWER switch and the TAPE/CARD switch.

Operating Modes	POWER Switch	TAPE/CARD Switch	Icon Display	Operation	🕮
CAMERA · 📼	CAMERA	(TAPE)		Recording movies on a tape	21
PLAY · 📼	PLAY			Playing movies from a tape	29
CAMERA · 💳	CAMERA	(CARD)		Recording still images or movies on a card	85, 89
PLAY · 💳	PLAY			Playing movies or viewing still images from a card	92

CAMERA · 📼 **: Function can be used in this mode.**

CAMERA · 📼 **: Function cannot be used in this mode.**

Trademark Acknowledgments

- Mini DV is a trademark.
- SD is a trademark.
- Windows® is either a registered trademark or trademark of Microsoft Corporation in the United States and/or other countries.
- Macintosh and Mac OS are trademarks of Apple Computer, Inc., registered in the United States and other countries.
- Other names and products not mentioned above may be registered trademarks or trademarks of their respective companies.

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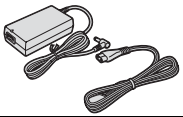
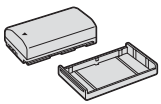
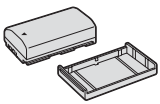
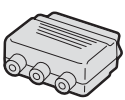
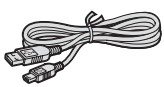
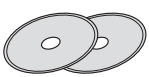
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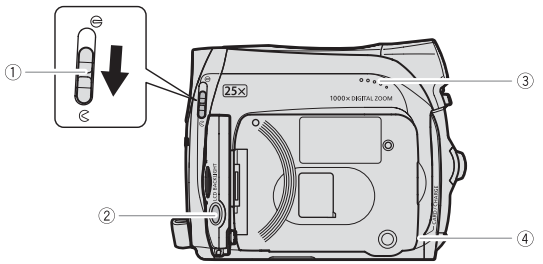
Checking the Supplied Accessories

CA-570 Compact Power Adapter (incl. power cord) 	***MV960/MV950*** NB-2LH Battery Pack 	***MV940/MV930*** BP-2L5 Battery Pack 	Lithium Button Battery CR1616 
MV960/MV950 ***MV940*** WL-D85 Wireless Controller 	Lithium Button Battery CR2025 for Wireless Controller 	SS-900 Shoulder Strap 	STV-250N Stereo Video Cable 
PC-A10 SCART Adapter* 	IFC-300PCU USB Cable 	DIGITAL VIDEO SOLUTION DISK For Windows For Macintosh 	

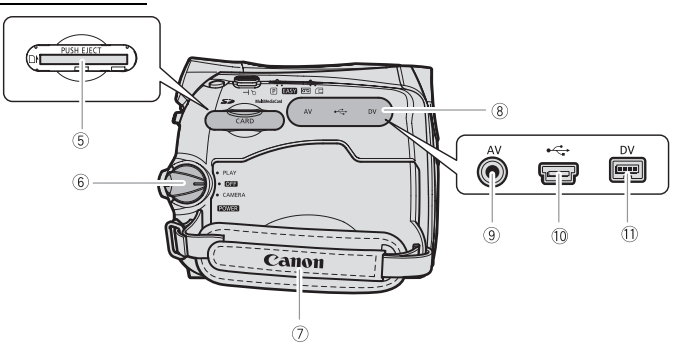
* Europe only.

MV960/MV950/MV940/MV930

Left side view

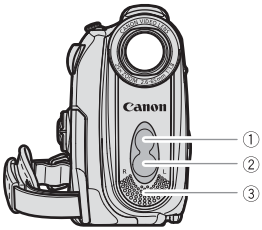


Right side view

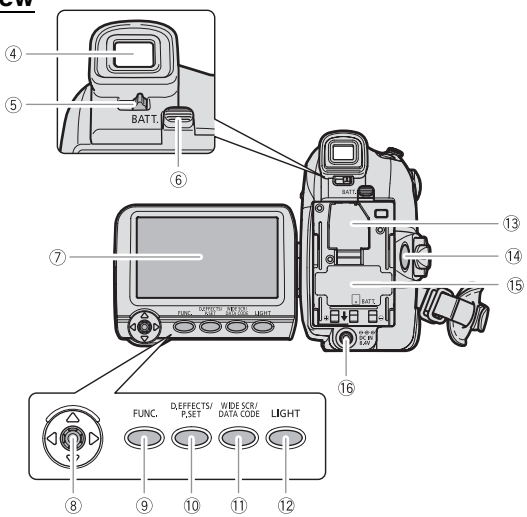


① Lens cover switch (📖 21, 85) (open, closed)	⑥ POWER switch (📖 4)
② LCD BACKLIGHT button (📖 18)	⑦ Grip belt (📖 16)
③ Speaker (📖 31)	⑧ Terminal cover
④ CHARGE indicator (📖 12) / CARD access indicator (📖 85, 89)	⑨ AV terminal (📖 32, 72, 75, 77)
⑤ Memory card slot (📖 81)	⑩ USB terminal (📖 97, 103)
	⑪ DV terminal (📖 70, 73, 80)

Front view

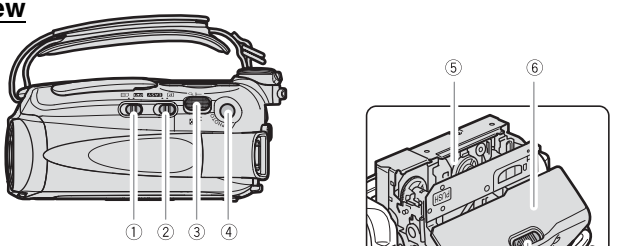


Rear view

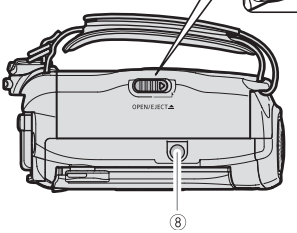


① Remote sensor (📖 17)	⑩ D.EFFECTS button (📖 56)/ P.SET button (📖 97)
② ***MV960/MV950*** White LED light (assist lamp) (📖 52)	⑪ WIDE SCR button (📖 60) / DATA CODE button (📖 62)
③ Stereo microphone	⑫ ***MV960/MV950*** LIGHT button (📖 52)
④ Viewfinder (📖 16)	⑬ Backup battery compartment (📖 14)
⑤ Dioptric adjustment lever (📖 16)	⑭ Start/stop button (📖 21, 89)
⑥ BATT. (battery release) button (📖 12)	⑮ Battery attachment unit (📖 12) / Serial number
⑦ LCD screen (📖 18)	⑯ DC IN terminal (📖 12)
⑧ Joystick (📖 3)	
⑨ FUNC. button (📖 36)	

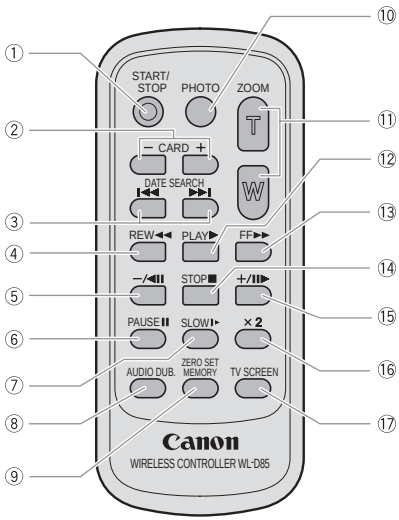
Top view



Bottom view



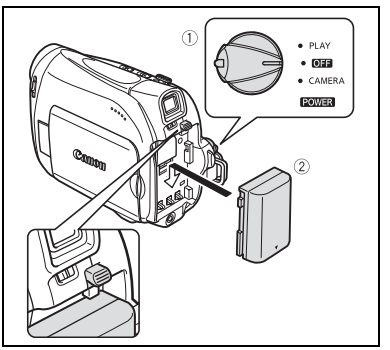
① TAPE/CARD switch (📖 4)	⑤ Cassette compartment (📖 15)
② Program selector (📖 41) EASY Easy recording P Recording programs	⑥ Cassette compartment cover (📖 15)
③ Zoom lever (📖 25)	⑦ OPEN/EJECT ⏏ switch (📖 15)
④ PHOTO button (📖 85)	⑧ Tripod socket (📖 28)



① START/STOP button (📖 21, 89)	⑩ PHOTO button (📖 85)
② CARD –/+ buttons (📖 92)	⑪ Zoom buttons (📖 25)
③ DATE SEARCH ⏮/⏭ buttons (📖 65)	⑫ PLAY ▶ button (📖 29)
④ REW ◀◀ button (📖 29)	⑬ FF ▶▶ button (📖 29)
⑤ –/◀ II button (📖 30)	⑭ STOP ■ button (📖 29)
⑥ PAUSE II button (📖 30)	⑮ +/II ▶ button (📖 30)
⑦ SLOW I▶ button (📖 30)	⑯ ×2 button (📖 30)
⑧ AUDIO DUB. button (📖 77)	⑰ TV SCREEN button (📖 107)
⑨ ZERO SET MEMORY button (📖 64)	

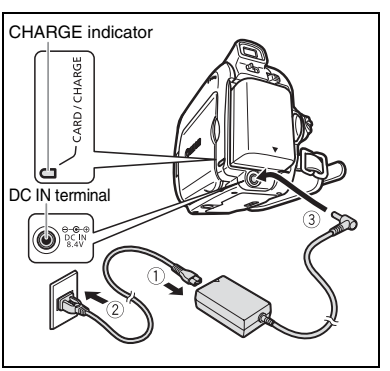
Attaching the Battery Pack

1. **Turn the POWER switch to OFF.**
2. **Attach the battery pack to the camcorder.**
 - Remove the terminal cover of the battery pack.
 - Press lightly and slide the battery pack in the direction of the arrow until it clicks.



Charging the Battery Pack

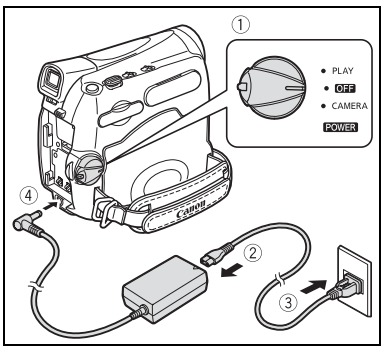
1. **Connect the power cord to the adapter.**
2. **Plug the power cord into a power outlet.**
3. **Connect the power adapter to the camcorder's DC IN terminal.**
 The CHARGE indicator starts flashing. The indicator will stay on when the charging is completed.
4. **When the charging is completed, disconnect the power adapter from the camcorder. Unplug the power cord from the power outlet and disconnect it from the adapter.**
5. **Remove the battery pack after use.**
 Press the BATT. button to remove the battery.



Using a Household Power Source

Connect to a household power source to use the camcorder without worrying about the battery power. You can keep the battery pack attached; the battery power will not be consumed.

1. **Turn the POWER switch to OFF.**
2. **Connect the power cord to the power adapter.**
3. **Plug the power cord into a power outlet.**
4. **Connect the power adapter to the camcorder's DC IN terminal.**



- ❍ Turn off the camcorder before connecting or disconnecting the power adapter.
- ❍ If the adapter is used close to a TV, it may cause picture interference. Move the adapter away from the TV or the antenna cable.
- ❍ Do not connect any products that are not expressly recommended to the camcorder's DC IN terminal or to the power adapter.
- ❍ You may hear some noise from the power adapter during use. This is not a malfunction.
- ❍ Do not disconnect and reconnect the power cord while charging a battery pack. Charging may stop. The battery pack may not be charged correctly even if the CHARGE indicator is continuously on. The battery pack may also not be charged correctly when a power outage occurs during charging. Remove the battery pack and attach it back to the camcorder.

- ❍ When the power adapter or the battery pack is defective, the CHARGE indicator flashes rapidly (at about 2 flashes/second) and charging stops.
- ❍ The CHARGE indicator informs you about the charge status.
 0-50%: Flashes once every second
 More than 50%: Flashes twice every second
 100%: Continuously on
- ❍ We recommend charging the battery pack in temperatures between 10 °C and 30 °C. Outside the temperature range of 0 °C to 40 °C, the charging will not start. If the battery temperature goes outside this temperature range while charging, the CHARGE indicator will start flashing rapidly and the charging will stop.
- ❍ A lithium ion battery pack can be charged at any charge state. Unlike conventional battery packs, you do not need to completely use or discharge it before charging.
- ❍ We recommend that you prepare battery packs 2 to 3 times longer than you think you might need.
- ❍ To conserve battery power, turn off the camcorder instead of leaving it in record pause mode.

❍ **Charging, Recording and Playback Times**

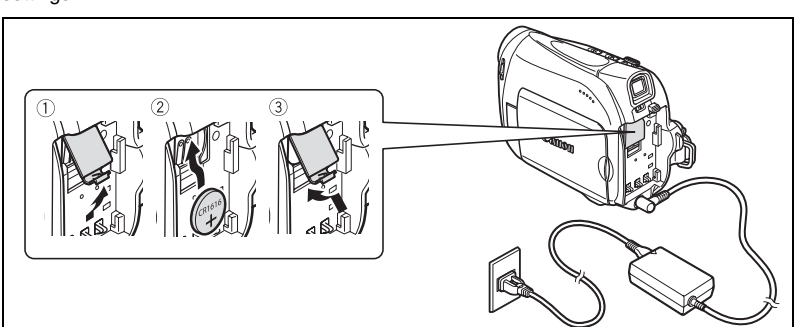
The following times are approximate and vary according to the charging, recording or playback conditions.

Battery Pack		**BP-2L5**	**NB-2L**	**NB-2LH**	**BP-2L12**	**BP-2L14**
Charging Time		95 min.	110 min.	125 min.	195 min.	220 min.
Max. Recording Time						
Viewfinder		90 min.	105 min.	125 min.	220 min.	270 min.
LCD	normal	85 min.	100 min.	120 min.	215 min.	260 min.
	bright	80 min.	90 min.	110 min.	200 min.	240 min.
Typical RecordingTime*						
Viewfinder		50 min.	55 min.	65 min.	120 min.	150 min.
LCD	normal	50 min.	55 min.	65 min.	120 min.	145 min.
	bright	45 min.	50 min.	60 min.	110 min.	140 min.
Playback Time		90 min.	105 min.	125 min.	225 min.	275 min.

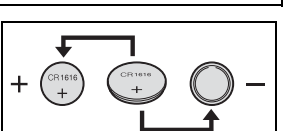
* Approximate times for recording with repeated operations such as start/stop, zooming, power on/off. Actual time may be shorter.

Installing the Backup Battery

The backup battery (lithium button battery CR1616) allows the camcorder to retain the date, time (📖 19) and other camcorder settings while the power source is disconnected. Connect a power source to the camcorder when replacing the backup battery to retain the settings.



1. **Open the backup battery cover.**
2. **Insert the backup battery with the + side facing out.**
3. **Close the cover.**

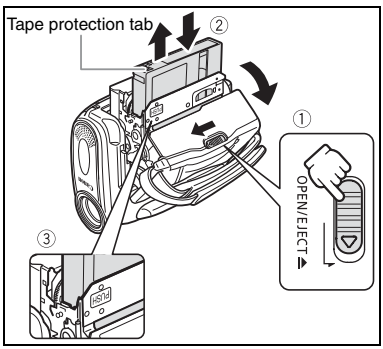


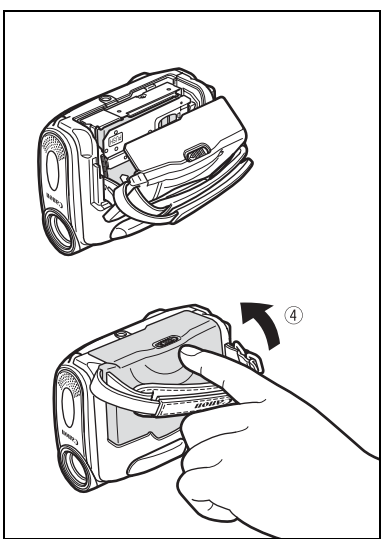
The backup battery has a life span of about a year. “ ” flashes in red to inform you that it needs to be replaced.

Loading/Unloading a Cassette

Use only videocassettes marked with the Mini DV logo.

1. **Slide the OPEN/EJECT ⏏ switch and open the cassette compartment cover.**
 The cassette compartment opens automatically.
2. **Load/unload the cassette.**
 - Load the cassette with the window facing the grip belt.
 - Unload the cassette by pulling it straight out.
3. **Press the PUSH mark on the cassette compartment until it clicks.**
4. **Wait for the cassette compartment to retract automatically and close the cassette compartment cover.**



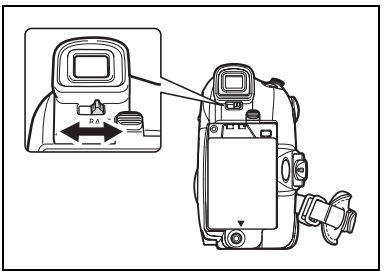


❍ Do not interfere with the cassette compartment while it is opening or closing automatically, or attempt to close the cover before the cassette compartment has fully retracted.
❍ Be careful not to get your fingers caught in the cassette compartment cover.

If the camcorder is connected to a power source, cassettes can be loaded/unloaded even if the POWER switch is set to OFF.

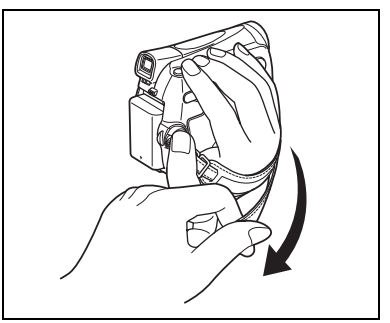
Adjusting the Viewfinder (Dioptric Adjustment)

1. **Turn on the camcorder and keep the LCD panel closed.**
2. **Adjust the dioptric adjustment lever.**



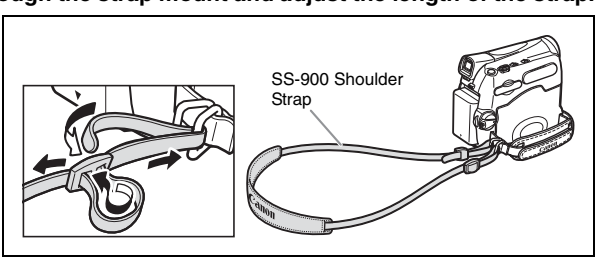
Fastening the Grip Belt

Adjust the grip belt so that you can reach the zoom lever with your index finger, and the start/stop button with your thumb.



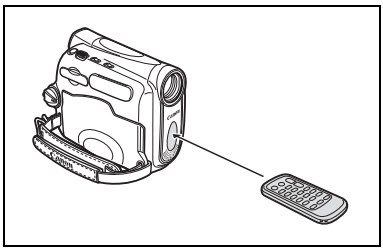
Attaching the Shoulder Strap

Pass the ends through the strap mount and adjust the length of the strap.



Using the Wireless Controller

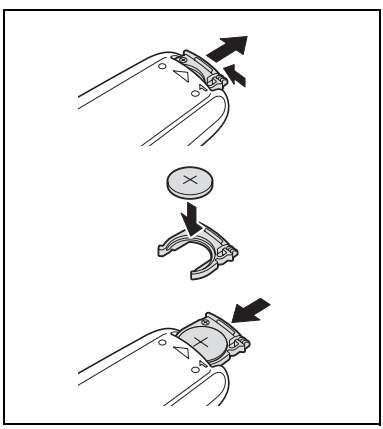
Point it at the camcorder's remote sensor when you press the buttons.



Inserting the Battery

The wireless controller operates with a lithium button battery CR2025.

1. **Pull out the battery holder.**
2. **Place the lithium button battery with the + side facing up.**
3. **Insert the battery holder.**

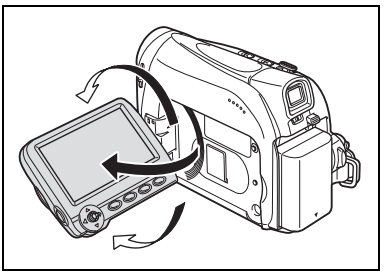


- ❍ The wireless controller may not work properly when the remote sensor is subjected to strong light sources or direct sunlight.
- ❍ If the wireless controller does not work, check if the remote sensor is set to [OFF] (📖 67).
- ❍ When the camcorder cannot be operated with the wireless controller, or when it can only be operated at a very close range, replace the battery.

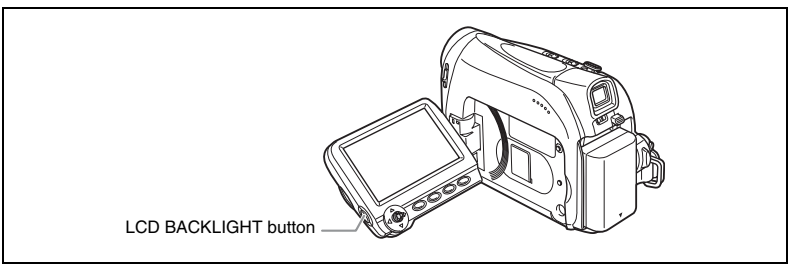
Rotating the LCD Screen

Open the LCD panel 90 degrees.

- You can rotate the panel by 90 degrees outward.
- You can rotate the panel by 180 degrees inward.



LCD Backlight



You can switch the brightness of the LCD screen between normal and bright by pressing the LCD BACKLIGHT button. This is useful for outdoor recordings.

Press the LCD BACKLIGHT button.

- ❍ This setting does not affect the brightness of the recording or the viewfinder screen.
- ❍ When using a battery pack, the camcorder retains the setting even if you change the position of the POWER switch.
- ❍ The battery usage time shortens when the LCD screen is set brighter (📖 14).

Setting the Time Zone, Date and Time

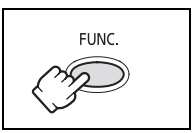
Set the time zone, date and time when you first start using your camcorder, or when you have replaced the backup battery.

Setting the Time Zone/Daylight Saving Time

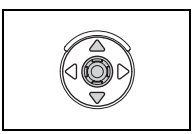
CAMERA · | PLAY · | CAMERA · | PLAY ·

MENU (📖 36) → DATE/TIME SETUP → T.ZONE/DST PARIS

1. **Press the FUNC. button to open the FUNC. menu.**
 The FUNC. menu will open. Continue the procedure with the joystick to open the setup menus.



2. **With the joystick select (▲▼) the icon and press ().**
3. **Select (▲▼) the [DATE/TIME SETUP] menu and press (). Then, select (▲▼) the [T.ZONE/DST] option and press ().**
 The time zone setting appears (see table on the next page). The default setting is Paris or Singapore depending on the region.



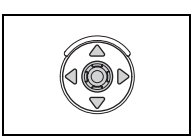
4. **Select (▲▼) your time zone and press ().**
 To adjust for daylight saving time, select the time zone with the " ☀ " next to the area.

Setting the Date and Time

CAMERA · | PLAY · | CAMERA · | PLAY ·

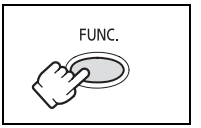
MENU (📖 36) → DATE/TIME SETUP → DATE/TIME 1.JAN.2006 12:00AM

5. **Select (▲▼) the [DATE/TIME] option and press ().**
 A selection frame will be displayed around the date and the selection arrows around the day will flash.
6. **With the joystick change (▲▼) the day as required and move (▶) to the next field.**
 - The selection arrows will flash around the next field of the date/time.
 - Set the month, year, hours and minutes in the same way.
 - If you do not need to change all settings, you can use the joystick to move **(◀▶)** to the specific setting you want to change.



7. **Press () to start the clock.**

8. Press the FUNC. button to close the menu.



Time Zones and Difference from GMT/UTC.

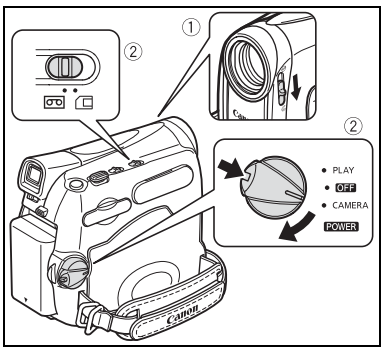
London	GMT/UTC	Wellington (WELLINGTN)	+12
Paris	+1	Samoa	-11
Cairo	+2	Honolulu	-10
Moscow	+3	Anchorage	-9
Dubai	+4	Los Angeles (L.A.)	-8
Karachi	+5	Denver	-7
Dacca	+6	Chicago	-6
Bankok	+7	New York	-5
Singapore	+8	Caracas	-4
Tokyo	+9	Rio de Janeiro (RIO)	-3
Sydney	+10	Fernando de Noronha (FERNANDO)	-2
Solomon	+11	Azores	-1

Once you have set time zone, date and time, you do not need to reset the clock each time you travel to another time zone. Just set the time zone to the one of your destination, and the camcorder automatically adjusts the clock.

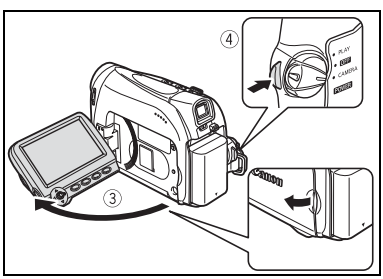
Before You Begin Recording
Make a test recording first to check if the camcorder operates correctly. If necessary, clean the video heads (📖 114).

Recording

1. **Open the lens cover (move the lens cover switch down to).**
2. **Set the camcorder to CAMERA · mode.**
 Set the POWER switch to CAMERA and the TAPE/CARD switch to .

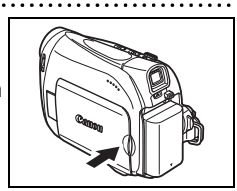


3. **Open the LCD panel.**
4. **Press the start/stop button to begin recording.**
 Press the start/stop button again to pause the recording.



When You Have Finished Recording

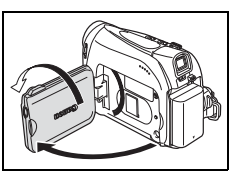
1. **Turn the POWER switch to OFF.**
2. **Close the LCD panel.**
3. **Close the lens cover (move the lens cover switch to).**
4. **Unload the cassette.**
5. **Disconnect the power source.**



- **About the LCD and viewfinder screen: The screens are produced with extremely high-precision manufacturing techniques, with more than 99.99% of the pixels operating to specification. Less than 0.01% of the pixels may occasionally misfire or appear as black or green dots. This has no effect on the recorded image and does not constitute a malfunction.**
- **When powered by a battery pack, the camcorder shuts off to save power if left without any operation for 5 minutes. Approximately 30 seconds before the camcorder shuts off the message "⚠ AUTO POWER OFF" will appear. To continue recording, turn the POWER switch to OFF and then back to CAMERA.**
- Wait until the tape counter stops completely before you start recording.
- When you do not remove the cassette, you can record the next scene without producing any noise or blank sections between the recordings even if you turn the camcorder off.
- Bright light may make it difficult to use the LCD screen. In such case, use the viewfinder instead.
- When recording near loud sounds (such as fireworks, drums or concerts), sound may become distorted or may be recorded not in the actual sound level. This is not a malfunction.

Allowing the Subject to Monitor the LCD Screen

You can rotate the LCD panel so that the screen faces in the same direction as the lens. The viewfinder switches on allowing you to use the viewfinder while the subject can monitor the screen.



Displaying the Level Marker

Use the level marker as a horizontal guideline to frame subjects more accurately.

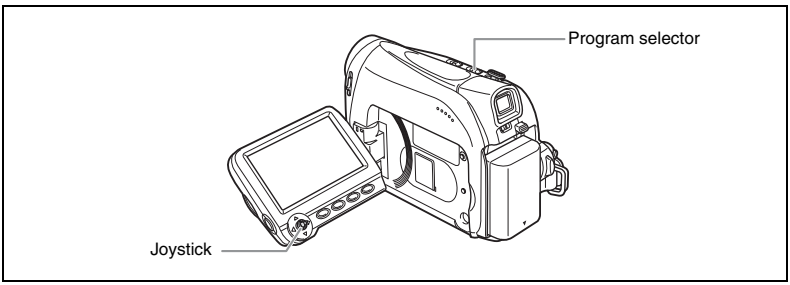
CAMERA · PLAY · CAMERA · PLAY ·

MENU (📖 36)



1. **Press the FUNC. button to open the FUNC. menu.**
2. **With the joystick select (▲▼) the icon and press ().**
3. **Select (▲▼) the [DISPLAY SETUP/] menu and press (). Then, select (▲▼) the [LEVEL MARKER] option and press ().**
4. **Set it to [ON] and press () to save the changes.**
5. **Press the FUNC. button to close the menu.**
 The level marker will appear.

Reviewing and Searching when Recording

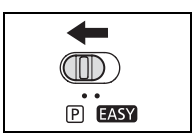


CAMERA · PLAY · CAMERA · PLAY ·

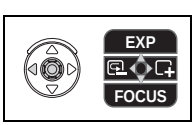
Record Review

In record pause mode, this function allows you to review the last few seconds of your recording to check if it has been recorded properly.

1. **Set the program selector to P.**
2. **If the joystick guide does not appear on screen, press () to display it.**
3. **Push the joystick (◀) momentarily towards and release it.**



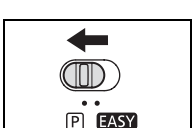
The camcorder rewinds the tape, plays back the last few seconds, and returns to record pause mode.



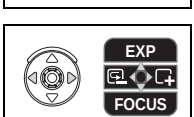
Record Search

In record pause mode, this function allows you to play back the tape (forward or reverse) to locate the point where you wish to begin recording.

1. **Set the program selector to P.**
2. **If the joystick guide does not appear on screen, press () to display it.**



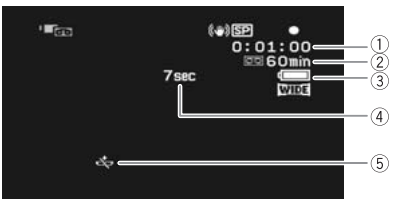
3. **Hold the joystick pushed (◀) towards to search back towards the beginning of the recording or pushed (▶) towards to search forward towards the end of the recording.**



- Release the joystick at the point where you wish to begin recording.
- The camcorder returns to record pause mode.

When the camcorder shuts off automatically, the record review and record search functions will not work. To resume normal operation turn the POWER switch to OFF and then back to CAMERA.

Screen Displays during Recording



① Time Code

Indicates the recording time in hours, minutes and seconds.

② Remaining tape

Indicates the remaining time of the tape in minutes. "▭" moves during recording. "▭END" flashes when the tape reaches the end.

- When the time left is less than 15 seconds, the remaining tape time may not appear.
- Depending on the type of the tape, the indication may not be displayed correctly.

③ Remaining battery charge

The battery symbol indicates the charge status of the battery pack.



- "▭" starts flashing in red when the battery pack is empty.
- When you attach an empty battery pack, the power may turn off without displaying "▭".
- The actual battery charge may not be indicated accurately depending on the conditions under which the battery pack and the camcorder are used.

④ Recording reminder

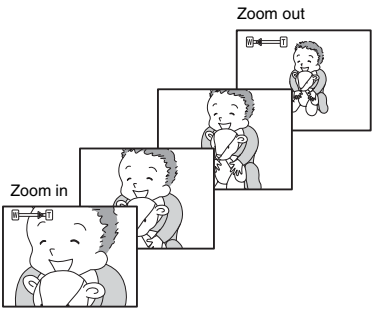
The camcorder counts from 1 to 10 seconds when you start recording. This is helpful to avoid scenes that are too short.

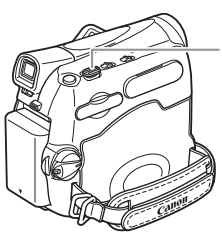
⑤ When "▭" flashes

"▭" flashes in red when the lithium button battery is not installed, or when it needs replacing.

Zooming

The zoom is available in the CAMERA · 📼 and CAMERA · 💾 modes. When recording on the tape, in addition to the 25x optical zoom you can also use the digital zoom.

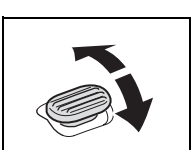




25x Optical Zoom

CAMERA · 📼 | PLAY · 📼 | CAMERA · 💾 | PLAY · 💾

Move the zoom lever toward W **to zoom out (wide-angle). Move it toward** T **to zoom in (telephoto).**
You can also change the zoom speed (📖 27).



- ❍ You can also use the T and W buttons on the wireless controller. The zoom speed with the wireless controller will be the same as with the camcorder (when one of the fixed zoom speed levels is selected) or fixed at [SPEED 3] (when [VARIABLE] is selected).
- ❍ Keep at least 1 m to the subject. At wide-angle, you can focus on a subject as close as 1 cm.
- ❍ The zoom speed is slightly faster in record pause mode.

Digital Zoom

When the digital zoom is activated, the camcorder automatically switches between optical and digital zoom. With digital zoom, image resolution becomes lower the more you zoom in.

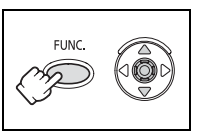
MV960/MV950	MV940/MV930
100x/1000x digital zoom	100x/800x digital zoom

CAMERA · PLAY · CAMERA · PLAY ·

MENU (📖 36)



1. **Press the FUNC. button to open the FUNC. menu.**



2. **With the joystick select (▲▼) the icon and press (●).**
3. **Select (▲▼) the [CAMERA SETUP] menu and press (●). Then, select (▲▼) the [D.ZOOM] option and press (●).**
4. **Select either [100x] or [1000x] (MV960/MV950) or [800x] (MV940/MV930) and press (●) to save the changes.**
5. **Press the FUNC. button to close the menu.**

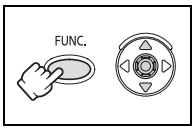
- Digital zoom cannot be used in the Night recording program.
- A zoom indicator appears for 4 seconds. It extends in light blue when the digital zoom is set to 100x, and extends further in dark blue when set to 1000x (MV960/MV950) or 800x (MV940/MV930).

Selecting the Zoom Speed

You can set the zoom speed to variable or to one of 3 levels of fixed zoom speeds. When set to [VARIABLE], the zoom speed depends on how you activate the zoom lever. Press softly for a slower zoom or press more strongly for a faster zoom.

CAMERA · | PLAY · | CAMERA · | PLAY ·

MENU (📖 36) → CAMERA SETUP → ZOOM SPEED VARIABLE



1. **Press the FUNC. button to open the FUNC. menu.**
2. **With the joystick select (▲▼) the icon and press ().**
3. **Select (▲▼) the [CAMERA SETUP] menu and press (). Then, select (▲▼) the [ZOOM SPEED] option and press ().**
4. **Select a setting option and press () to save the changes.**
5. **Press the FUNC. button to close the menu.**

The fastest zoom speed can be achieved with the [VARIABLE] setting. Among the fixed zoom speeds [SPEED 3] is the fastest, and [SPEED 1] the slowest.

Holding the Camcorder

For maximum stability, grip the camcorder in your right hand and keep your right elbow pressed against your body. If necessary, support the camcorder with your left hand. Be careful that your fingers do not touch the microphone or lens.



For More Stability

Lean against a wall



Put the camcorder on a table



Kneel on one knee



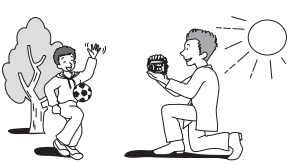
Use a tripod



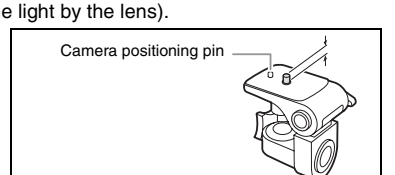
Lie on your elbow

Lighting

When recording outdoors, we recommend recording with the sun at your back.



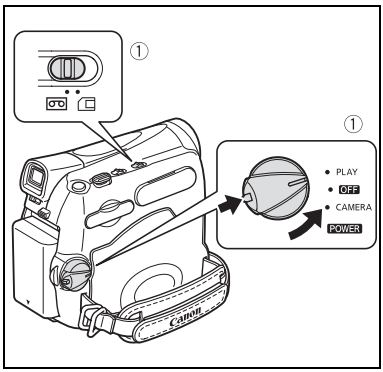
- When using a tripod, do not leave the viewfinder exposed to direct sunlight as it may melt (due to concentration of the light by the lens).
- Do not use tripods with fastening screws longer than 5.5 mm as it may damage the camcorder. The camcorder cannot be mounted on tripods with fixed (non-retractable) camera positioning pins.



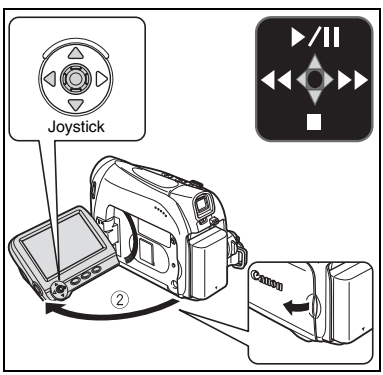
Playing Back a Tape

If the playback picture is distorted, clean the video heads using a Canon Head Cleaning Cassette or a commercially available digital video head-cleaning cassette (📖 114).

1. **Set the camcorder to PLAY · mode.**
 Set the POWER switch to PLAY and the TAPE/CARD switch to .

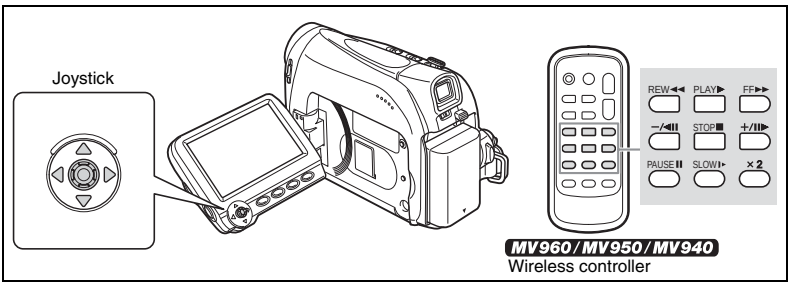


2. **Open the LCD panel.**
 You can also close the LCD panel with the screen facing out.
3. **If the joystick guide does not appear on screen, press () to display it.**
4. **Push the joystick (◀) towards ◀◀ to rewind the tape.**
5. **Push the joystick (▲) towards ▶/II to play back the tape.**
 Push (▲) again to pause the playback.
6. **Push the joystick (▼) towards ■ to stop the playback.**



- ❍ To use the viewfinder, close the LCD panel.
- ❍ About the screen display: During playback, the time code gives the hours, minutes, seconds and frames. The remaining tape time may not appear when the time left is less than 15 seconds.

Special Playback Modes



▶/II (Playback Pause)

During normal playback, push the joystick (▲) towards ▶/II or press the PAUSE II button on the wireless controller.

▶▶ (Fast Forward Playback) / ◀◀ (Rewind Playback)

Plays back the tape at 11.5 times normal speed (forward or reverse). During normal playback, hold the joystick pushed (▶) towards ▶▶ or pushed (◀) towards ◀◀. You can also press and hold the FF ▶▶ or REW ◀◀ button on the wireless controller instead. Release the joystick or wireless controller button to return to normal playback.

–/◀II (Reverse Playback)

During normal playback, press the –/◀II button on the wireless controller. Press the PLAY ▶ button on the wireless controller or push the joystick (▲) towards ▶/II to return to normal playback.

+/II▶ (Frame Advance) / –/◀II (Frame Reverse)

Plays back frame-by-frame. During playback pause, repeatedly press the +/II▶ or –/◀II button on the wireless controller. Hold the button pressed down to play back in continuous frame advance/reverse. Press the PLAY ▶ button on the wireless controller or push the joystick (▲) towards ▶/II to return to normal playback.

SLOW I▸ (Slow Forward)/(Slow Reverse)

Plays back at about 1/3 normal speed. During normal or reverse playback, press the SLOW I▸ button on the wireless controller. Press the PLAY ▶ button on the wireless controller or push the joystick (▲) towards ▶/II to return to normal playback.

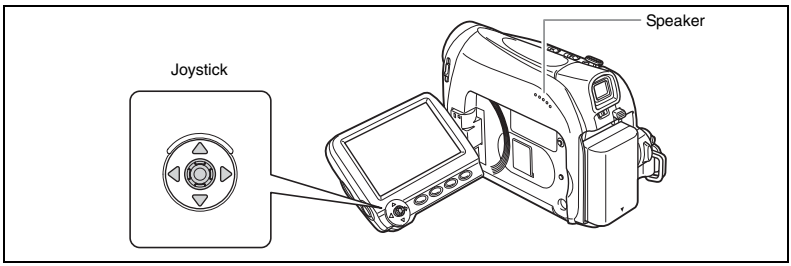
×2 (Forward x2 Playback)/(Reverse x2 Playback)

Plays back at 2 times the normal speed. During normal or reverse playback, press the ×2 button on the wireless controller. Press the PLAY ▶ button on the wireless controller or push the joystick (▲) towards ▶/II to return to normal playback.

- There is no sound during special playback.
- The picture may become distorted during some special playback modes.
- The camcorder stops the tape automatically after 5 minutes in playback pause to protect the tape and video heads.

Adjusting the Volume

When you use the LCD screen for playback, the camcorder plays back the sound using the built-in speaker. The sound will be muted when the LCD panel is closed or when there is a video input from the AV terminal (*MV960/MV950* only).

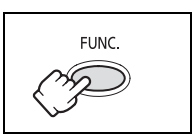


CAMERA · PLAY · CAMERA · PLAY ·

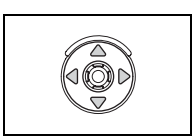
MENU (📖 36)



1. **Press the FUNC. button to open the FUNC. menu.**



2. **With the joystick select (▲▼) the speaker volume icon.**
3. **Adjust (◀▶) the volume as required.**

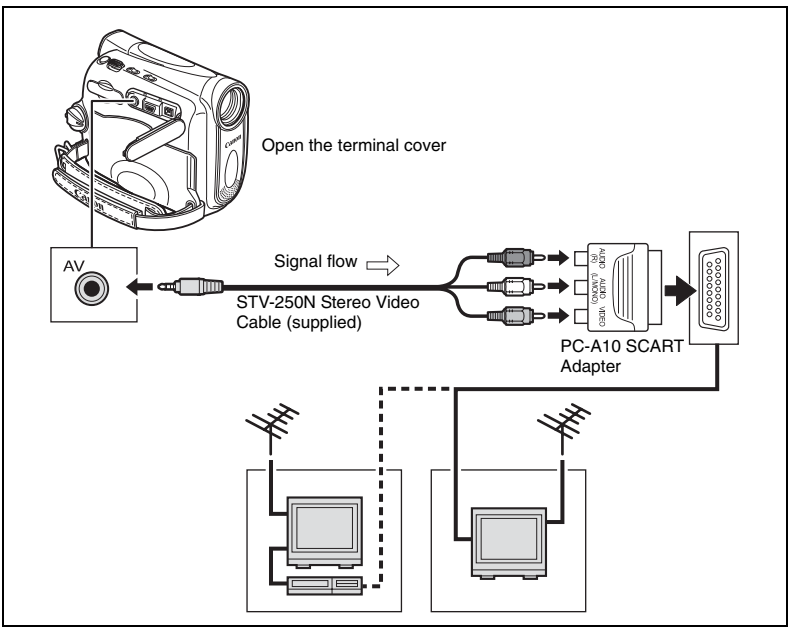


4. **Press the FUNC. button to save the setting and close the menu.**

 If you turn off the volume completely the volume display will change to "🔇".

TVs with SCART Terminal

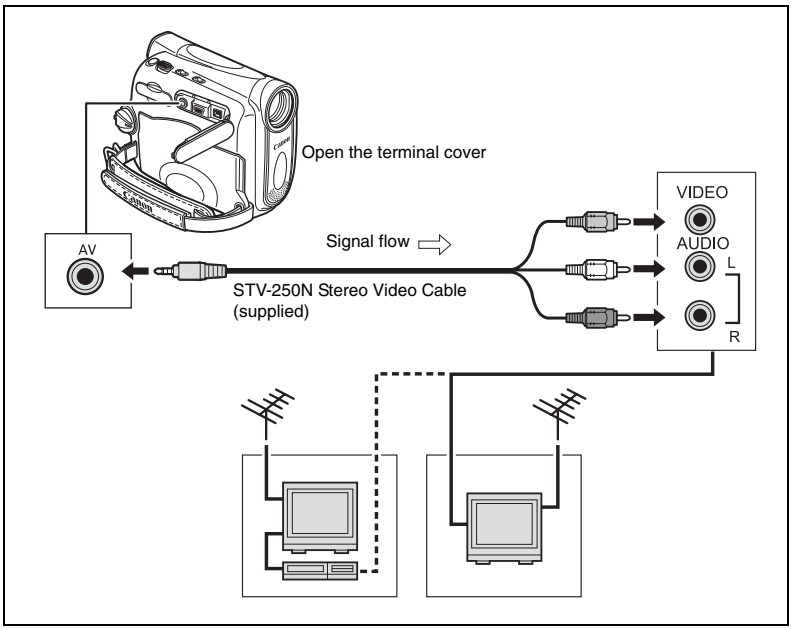
Refer also to the TV or VCR instruction manual.



1. **Turn off all the devices before starting the connections.**
2. **Connect the PC-A10 SCART Adapter to the TV or VCR's SCART terminal.**
3. **Connect the STV-250N Stereo Video Cable to the camcorder's AV terminal and the audio terminals on the SCART Adapter.**
 Connect the white plug to the white AUDIO terminal L (left), and the red plug to the red AUDIO terminal R (right) and the yellow plug to the yellow VIDEO terminal.
4. **If connecting to a TV, set the input selector to VIDEO. If connecting to a VCR, set the input selector to LINE.**

TVs with Audio/Video Terminals

Refer also to the TV or VCR instruction manual.



1. **Turn off all the devices before starting the connections.**
2. **Connect the STV-250N Stereo Video Cable to the camcorder's AV terminal and the audio/video terminals on the TV/VCR.**
 Connect the white plug to the white audio terminal L (left), the red plug to the red audio terminal R (right) and the yellow plug to the yellow video terminal VIDEO.
3. **If connecting to a TV, set the input selector to VIDEO. If connecting to a VCR, set the input selector to LINE.**

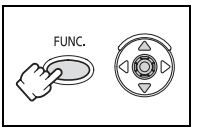
We recommend powering the camcorder from a household power source.

Selecting the Type of TV

During playback set the [TV TYPE] option according to the TV set to which you connect the camcorder.

CAMERA · | **PLAY ·** | CAMERA · | PLAY ·

MENU (📖 36) → VCR SETUP → TV TYPE WIDE TV



1. **Press the FUNC. button to open the FUNC. menu.**
2. **With the joystick select (▲▼) the icon and press (●).**
3. **Select (▲▼) the [VCR SETUP] menu and press (●). Then, select (▲▼) the [TV TYPE] option and press (●).**
4. **Select a setting option and press (●) to save the changes.**
 - WIDE TV: TV sets with 16:9 aspect ratio.
 - NORMAL TV: TV sets with 4:3 aspect ratio
5. **Press the FUNC. button to close the menu.**

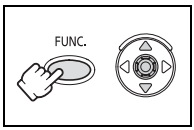
- ❍ Playing back recordings made in the widescreen mode on a normal TV: If the TV type is set to [NORMAL TV] the recording will be played back in "letterbox" display. If the TV type is set to [WIDE TV] the image will appear horizontally squeezed.
- ❍ If you connect the camcorder to a TV with Video ID-1 system, recordings made in the widescreen mode will be automatically played back in widescreen mode.
- ❍ When the TV type is set to [NORMAL TV] the digital effects are not available in PLAY · mode.

Selecting the Audio Output Channel

You can select the output channels when playing back a tape with audio recorded on two channels.

CAMERA · | **PLAY ·** | CAMERA · | PLAY ·

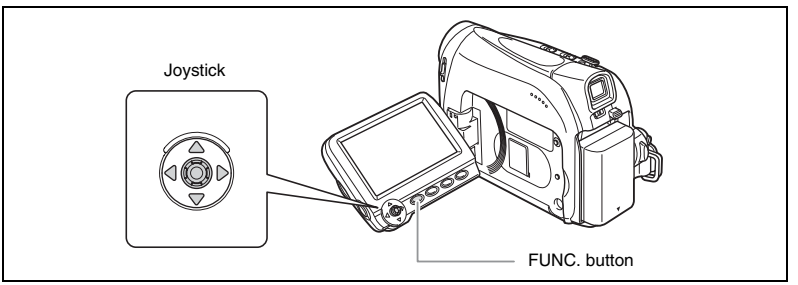
MENU (36) → AUDIO SETUP → OUTPUT CH L/R



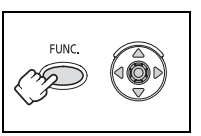
1. **Press the FUNC. button to open the FUNC. menu.**
2. **With the joystick select (▲▼) the icon and press ().**
3. **Select (▲▼) the [AUDIO SETUP] menu and press (). Then, select (▲▼) the [OUTPUT CH] option and press ().**
4. **Select (▲▼) a setting option and press () to save the changes.**
 - L/R: Stereo: L+R channels, Bilingual: Main+Sub.
 - L/L: Stereo: L channel, Bilingual: Main.
 - R/R: Stereo: R channel, Bilingual: Sub.
5. **Press the FUNC. button to close the menu.**

The setting resets to the [L/R] setting when you turn the camcorder off.

The camcorder's functions and settings are controlled from a series of menus that appear when you press the FUNC. button. Most basic functions appear on the first menu screen - the FUNC. menu. For more advanced settings you have to open the setup menus by selecting the [MENU] option from the FUNC. menu.



Selecting Menus and Settings



FUNC. menu:

1. **Press the FUNC. button to open the FUNC. menu.**
2. **With the joystick select (▲▼) the icon of the function you want to change.**
3. **Select (◀▶) a setting option from the bottom bar.**
 With some settings, you will need to press () or make further selections with the joystick. In such cases, a joystick icon (next to the bottom bar) or small arrows (around the setting option) will be displayed as an additional operation guide.
4. **Press the FUNC. button to save the setting and close the menu.**

Setup menus:

1. **Press the FUNC. button to open the FUNC. menu.**
2. **With the joystick select (▲▼) the icon and press ().**
3. **Select (▲▼) a setup menu and press ().**
4. **Select (▲▼) a menu item and press ().**
5. **Select (▲▼) a setting option and press () to save the changes.**
6. **Press the FUNC. button to close the menu.**

- ❍ Pressing the FUNC. button at any time closes the menu.
- ❍ Items that are not available appear grayed out.
- ❍ The menu will not appear when you press the FUNC. button while recording movies.
- ❍ You can open the menu directly on the setup menus screen by holding the FUNC. button pressed for more than 2 seconds.

Menu and Default Settings

Default settings are shown in boldface.

CAMERA · 📼

* The item will not appear in EASY mode.

Submenu	Menu Item	Setting Options	📖
FUNC. menu	Recording Programs*	**PROGRAM AE**, PORTRAIT, SPORTS, NIGHT, SNOW, BEACH, SUNSET, SPOTLIGHT, FIREWORKS	41
	White Balance	**AUTO**, DAYLIGHT, TUNGSTEN, SET	48
	Image Effect	**IMAGE EFFECT OFF**, VIVID, NEUTRAL, SOFT SKIN DETAIL	49
	Self Timer	**SELF TIMER OFF**, SELF TIMER ON	53
	Digital Effects	**D.EFFECT OFF**, FADER, EFFECT, CARD MIX	56
	Still Image Recording	**STILL IMG REC OFF**, FINE/640x480, NORMAL/640x480	85
CAMERA SETUP	SHUTTR SPEED*	**AUTO**, 1/50, 1/120, 1/250, 1/500, 1/1000, 1/2000	50
	A.SL SHUTTER	**ON**, OFF	51
	D.ZOOM	MV960/MV950: **OFF**, 100x, 1000x / MV940/MV930: **OFF**, 100x, 800x	26
	ZOOM SPEED	**VARIABLE**, SPEED 3, SPEED 2, SPEED 1	27
	IMG STAB*	**ON**, OFF	68
VCR SETUP	REC MODE	**STD PLAY,** LONG PLAY	54
AUDIO SETUP	WIND SCREEN*	**AUTO**, OFF	55
	AUDIO MODE	16bit, **12bit**	55
DISPLAY SETUP/💬	BRIGHTNESS	–+	67
	TV SCREEN	**ON**, OFF	107
	LEVEL MARKER	ON, **OFF**	22
	LANGUAGE	See list of languages.	66
	DEMO MODE	**ON**, OFF	69
SYSTEM SETUP	WL.REMOTE	**ON**, OFF	67
	BEEP	**HIGH VOLUME**, LOW VOLUME, OFF	67
	START-UP IMG	**ON**, OFF	68
	POWER SAVE	ON, **OFF**	22
	FILE NOS.	RESET, **CONTINUOUS**	84
DATE/TIME SETUP	T.ZONE/DST	See list of time zones.	19
	DATE/TIME	-	19
	DATE FORMAT	Y.M.D : 2006.1.1 AM12:00 M.D, Y : JAN. 1, 2006 12:00AM **D.M.Y : 1. JAN. 2006 12:00AM**	66

PLAY ·

Submenu	Menu Item	Setting Options	🕮
FUNC. menu	Speaker Volume	– +	31
	Recording Pause	-	72, 73
	End Search	-	63
	Digital Effects	**D.EFFECT OFF**, FADER, EFFECT	56
	Card Movie Size	**320x240**, 160x120	83
	Still Image Quality	S.FINE/640x480, **FINE/ 640x480**, NORMAL/640x480	82
VCR SETUP	REC MODE	**STD PLAY**, LONG PLAY	54
	AV ➡ DV[1]	ON, **OFF**	75
	TV TYPE	NORMAL TV, **WIDE TV**	34
AUDIO SETUP	OUTPUT CH	**L/R**, L/L, R/R	35
	AUDIO DUB.[2]	**AUDIO IN**, MIC. IN	77
	WIND SCREEN	**AUTO**, OFF	55
	12bit AUDIO	**STEREO1**, STEREO2, MIX/FIXED, MIX/VAR.	79
	MIX BALANCE	ST-1 ST-2	79
	AUDIO MODE	16bit, **12bit**	55
DISPLAY SETUP/	BRIGHTNESS	– +	67
	TV SCREEN	ON, **OFF**	107
	DISPLAYS	**ON**, OFF <PLAYBK>	107
	6SEC.DATE	ON, **OFF**	62
	DATA CODE	DATE, TIME, **DATE & TIME**	62
	LANGUAGE	See list of languages.	66
SYSTEM SETUP	WL.REMOTE	**ON**, OFF	67
	BEEP	**HIGH VOLUME**, LOW VOLUME, OFF	67
	START-UP IMG	**ON**, OFF	68
	FILE NOS.	RESET, **CONTINUOUS**	84
DATE/TIME SETUP	T.ZONE/DST	See list of time zones.	19
	DATE/TIME	-	19
	DATE FORMAT	Y.M.D : 2006.1.1 AM12:00 M.D, Y : JAN. 1, 2006 12:00AM **D.M.Y : 1. JAN. 2006 12:00AM**	66

[1] ***MV960*** only.
[2] ***MV960/MV940*** only.

* The item will not appear in EASY mode.

Submenu	Menu Item	Setting Options	🕮
FUNC. menu	Recording Programs*	**PROGRAM AE**, PORTRAIT, SPORTS, NIGHT, SNOW, BEACH, SUNSET, SPOTLIGHT, FIREWORKS	41
	White Balance	**AUTO**, DAYLIGHT, TUNGSTEN, SET	48
	Image Effect	**IMAGE EFFECT OFF**, VIVID, NEUTRAL, SOFT SKIN DETAIL	49
	Self Timer	**SELF TIMER OFF**, SELF TIMER ON	53
	Digital Effects	**D.EFFECT OFF**, BLK&WHT	56
	Movie Recording	**MOVIE REC OFF**, 320x240, 160x120	89
	Still Image Size/ Quality	**L 1024x768**, **S** 640x480	82
		SUPER FINE, **FINE**, NORMAL	
CAMERA SETUP	SHUTTR SPEED*	**AUTO**, 1/50, 1/120, 1/250	50
	A.SL SHUTTER	**ON**, OFF	51
	ZOOM SPEED	**VARIABLE**, SPEED 3, SPEED 2, SPEED 1	27
	FOCUS PRI.*	OFF, **ON: AiAF**, ON: CENTER	91
	REVIEW	OFF, **2sec**, 4sec, 6sec, 8sec, 10sec	88
AUDIO SETUP*	WIND SCREEN*	**AUTO**, OFF	55
DISPLAY SETUP/	BRIGHTNESS	− +	67
	TV SCREEN	**ON**, OFF	107
	LANGUAGE	See list of languages.	66
	DEMO MODE	**ON**, OFF	69
SYSTEM SETUP	WL.REMOTE	**ON**, OFF	67
	BEEP	**HIGH VOLUME**, LOW VOLUME, OFF	67
	START-UP IMG	**ON**, OFF	68
	POWER SAVE	ON, **OFF**	22
	FILE NOS.	RESET, **CONTINUOUS**	84
DATE/TIME SETUP	T.ZONE/DST	See list of time zones.	19
	DATE/TIME	-	19
	DATE FORMAT	Y.M.D : 2006.1.1 AM12:00 M.D, Y : JAN. 1, 2006 12:00AM **D.M.Y : 1. JAN. 2006 12:00AM**	66

PLAY ·

Submenu	Menu Item	Setting Options	📖
FUNC. menu	Speaker Volume	– +	31
	Slideshow	-	93
	Still Image Protection	**PROTECT OFF**, PROTECT ON	94
	Print Order	0-99 COPIES	101
	Transfer Order	**TRANS.ORDER OFF**, TRANS.ORDER ON	106
CARD OPERATIONS (Single Image Display)	PRINT ORD. ALL ERASE	**NO**, YES	102
	TRANS.ORD. ALL ERASE	**NO**, YES	106
	ERASE ALL IMAGES	**NO**, YES	95
	INITIALIZE	**NO**, YES	96
CARD OPERATIONS (Index Screen)	➡PROTECT	-	94
	➡PRINT ORDER	-	101
	➡TRANSFER ORDER	-	106
DISPLAY SETUP/💬	BRIGHTNESS	– +	67
	TV SCREEN	ON, **OFF**	107
	DISPLAYS	**ON**, OFF <PLAYBK>	107
	DATA CODE	DATE, TIME, **DATE & TIME**	62
	LANGUAGE	See list of languages.	66
SYSTEM SETUP	WL.REMOTE	**ON**, OFF	67
	BEEP	**HIGH VOLUME**, LOW VOLUME, OFF	67
	START-UP IMG	**ON**, OFF	68
DATE/TIME SETUP	T.ZONE/DST	See list of time zones.	19
	DATE/TIME	-	19
	DATE FORMAT	Y.M.D : 2006.1.1 AM12:00 M.D, Y : JAN. 1, 2006 12:00AM **D.M.Y : 1. JAN. 2006 12:00AM**	66
➡ PRINT	Appears when connecting a PictBridge compatible printer.		102

EASY Easy Recording Program

The camcorder adjusts focus, exposure and other settings automatically, allowing you to just point and shoot.



P Recording Programs

P Program AE

The camcorder adjusts focus, exposure and other settings automatically. However, you have the option of adjusting the settings manually.



Portrait

Use this mode to give accent to your subject by blurring the background or foreground. The blur effect increases the more you zoom to telephoto.



Sports

Use this mode to record sports scenes (such as tennis or golf) or moving objects (such as roller coasters).



Night

Use this mode to record in dimly lit places.



Snow

Use this mode to record in bright ski resorts. It prevents the subject from being underexposed.



Beach

Use this mode to record on a sunny beach. It prevents the subject from being underexposed.



Sunset

Use this mode to record sunsets in vibrant colors.



Spotlight

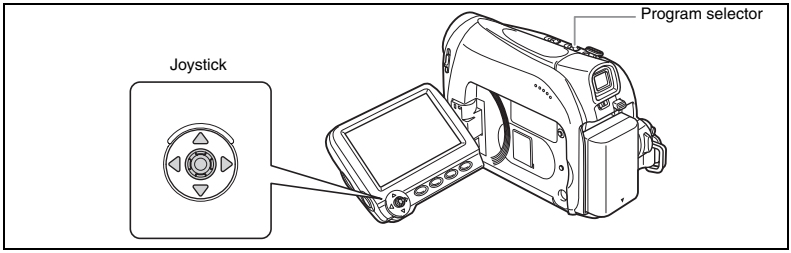
Use this mode to record spotlit scenes.



Fireworks

Use this mode to record fireworks.





Availability of Functions in Each Mode:

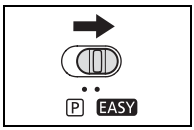
Program Selector	EASY	P								
Recording Program	▭	P								
Image Stabilizer	×(on)	○								
Focus	×(A)	○								
White Balance	×(A)	○	×							
Wind Screen	×(A)	○								
Shutter Speed	×(A)	○	× (A)							
Exposure Adjustment	×(A)	○								×
Digital Effects	×	○								
Card Mix	×	○								

○: Available ×: Not available A: Auto setting
Shaded area: Can be used only in CAMERA · 📼 mode.

Selecting the Easy Recording Program

CAMERA · 📼 | PLAY · 📼 | CAMERA · 💾 | PLAY · 💾

Set the program selector to EASY.
"▭" appears.



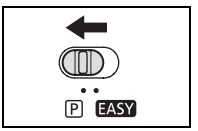
Selecting a Recording Program

CAMERA · 📼 | PLAY · 📼 | CAMERA · 💾 | PLAY · 💾

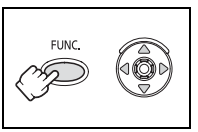
MENU
(📖 36)

P	PROGRAM AE

1. **Set the program selector to Ⓟ.**



2. **Press the FUNC. button to open the FUNC. menu.**
3. **With the joystick select (▲▼) the recording programs icon.**
4. **Select (◀▶) the recording program from the options on the bottom bar.**



5. **Press the FUNC. button to save the setting and close the menu.**
 The symbol of the recording program selected appears.

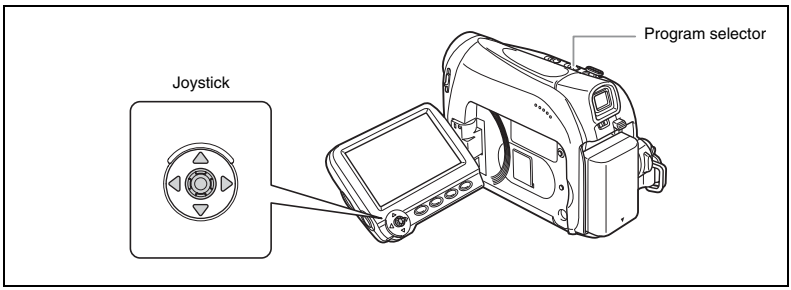
❍ Do not change the recording program while recording as the brightness of the image may change abruptly.
❍ Portrait/Sports mode:
The picture may not appear smooth when played back.
❍ Snow/Beach mode:
- The subject may become overexposed in dark surroundings. Check the image on the screen.
- The picture may not appear smooth when played back.

❍ Night mode:
- Moving subjects may leave a trailing afterimage.
- Picture quality may not be as good as in other modes.
- White points may appear on the screen.
- Autofocus may not work as well as in other modes. In such case, adjust the focus manually.
- The digital zoom cannot be used with this recording program.

❍ Fireworks mode:
To avoid camcorder shake, we recommend using a tripod. Use a tripod when recording in CAMERA · 💾 mode as the shutter speed slows down.

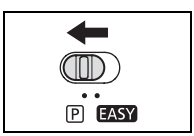
Adjusting the Exposure Manually

Adjust the exposure when a backlit subject becomes underexposed, or overexposed due to bright light.



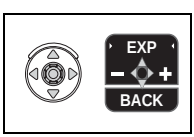
CAMERA · PLAY · CAMERA · PLAY ·

1. Set the program selector to P.



2. If the joystick guide does not appear on screen, press (●) to display it.

3. Push the joystick (▲) towards [EXP] to enter the exposure lock mode.



[EXP] on the joystick guide will be displayed in light blue and the exposure adjustment indicator and the neutral value "±0" appear on the screen.

4. Adjust (◀▶) the brightness of the image as necessary.

To return to the automatic exposure, push the joystick **(▲)** towards [EXP] once more. The exposure adjustment indicator will disappear and [EXP] will turn white again.

5. Push the joystick (▼) towards [BACK] to save the exposure setting.

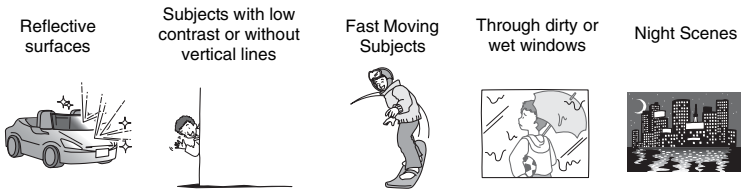
- When you operate the zoom during exposure lock, the brightness of the image may change.
- The adjustment range depends on the brightness at the time you locked the exposure.

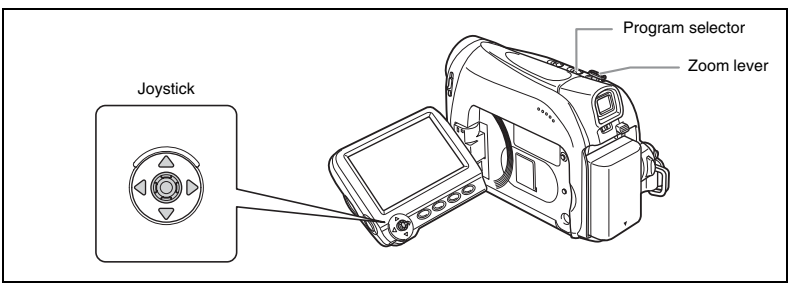
6. If necessary, press (●) again to hide the joystick guide.

The manual exposure setting will reset to auto exposure when you turn the camcorder off or change the recording program.

Adjusting the Focus Manually

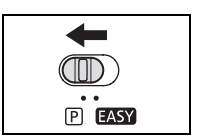
Autofocus may not work well on the following subjects. In such case, focus manually.





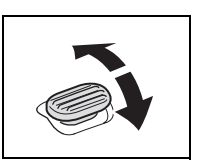
CAMERA · PLAY · CAMERA · PLAY ·

1. Set the program selector to Ⓟ.

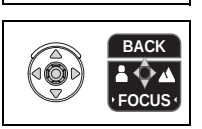


2. Adjust the zoom.

When you operate the zoom after adjusting the focus, the subject may not stay in focus. Adjust the zoom before the focus.



3. If the joystick guide does not appear on screen, press (⊛) to display it.



4. Push the joystick (▼) towards [FOCUS] to activate the manual focus.

[FOCUS] on the joystick guide will be displayed in light blue and “MF” appears on the screen.

5. Adjust (◀▶) the focus as necessary.

- Push the joystick (▶) towards ▲ for a farther focal distance or push it (◀) towards ▲ for a closer focal distance.

- To return to autofocus, push the joystick (▼) towards [FOCUS] once more. “MF” will disappear and [FOCUS] will turn white again.

6. Push the joystick (▲) towards [BACK] to save the focus adjustment.

7. If necessary, press (⊛) again to hide the joystick guide.



The manual focus will reset to autofocus when you set the program selector to EASY.

Infinity Focus

Use this function when you wish to focus on faraway subjects such as mountains or fireworks.

1. In the manual focus mode press (⊛) to display the joystick guide.

2. Keep the joystick pushed (▼) towards [FOCUS] for more than 2 seconds.

- At first, “MF” will appear on the screen and then it will be replaced by the “∞” symbol.
- In the infinity focus mode: If you operate the zoom or the joystick (◀▶) or if you turn the camcorder off, the infinity focus will be canceled and the camcorder will return to manual focus.

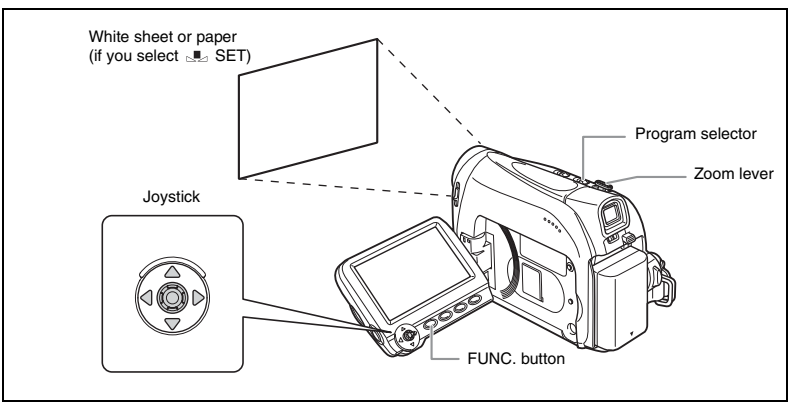
3. Push the joystick (▲) towards [BACK] to save the focus adjustment.

4. If necessary, press (⊛) again to hide the joystick guide.

Setting the White Balance

You can use the preset modes to reproduce colors more accurately, or set a custom white balance to obtain the optimal setting.

AWB AUTO	Settings are automatically set by the camcorder.
☀ DAYLIGHT	For recording outdoors on a bright day.
TUNGSTEN	For recording under tungsten and tungsten type (3-wavelength) fluorescent lighting.
SET	Use the custom white balance setting to make white subjects appear white under colored lighting.



CAMERA · PLAY · CAMERA · PLAY ·

MENU
(36)

AWB	AUTO

1. **Set the program selector to P.**
2. **Press the FUNC. button to open the FUNC. menu.**
3. **With the joystick select (▲▼) the white balance icon.**
4. **Select (◀▶) the white balance setting from the options on the bottom bar.**
 If you select a white balance setting other than [SET], continue to directly to step 6.

To set the custom white balance when you select [SET]:

5. **Point the camcorder at a white object, zoom in until it fills the whole screen and press (●).**
 - Keep the camcorder zoomed in at the white object until step 6 is completed.
 - The " " icon flashes and stops flashing when the adjustment is completed.
6. **Press the FUNC. button to save the setting and close the menu.**

- ❍ Use the auto setting for normal outdoor scenes.
- ❍ When the program selector is set to EASY, the white balance is preset to [AUTO].
- ❍ The camcorder retains the custom white balance setting even if you turn it off.
- ❍ When you have set the custom white balance:
 - Depending on the light source, "" may keep flashing. The result will still be better than with the auto setting.
 - Reset the white balance when the lighting condition changes.
 - Turn off the digital zoom.
- ❍ Custom white balance may provide better results in the following cases:
 - Changing lighting conditions
 - Close-ups
 - Subjects in a single color (sky, sea or forest)
 - Under mercury lamps or certain types of fluorescent lights

Selecting an Image Effect

You can record with different color saturation and contrast effects.

OFF IMAGE EFFECT OFF	Records with no image enhancing effects.
V VIVID	Emphasizes the contrast and color saturation.
N NEUTRAL	Tones down the contrast and color saturation.
SD SOFT SKIN DETAIL	Softens the details in the skin tone area for a more complimentary appearance.

CAMERA · PLAY · CAMERA · PLAY ·

MENU
(📖 36)



1. Press the FUNC. button to open the FUNC. menu.
2. With the joystick select (▲▼) the image effects icon.
3. Select (◀▶) the image effect from the options on the bottom bar.
4. Press the FUNC. button to save the setting and close the menu.

- ❍ The image effects cannot be used when the program selector is set to EASY.
- ❍ [SOFT SKIN DETAIL]: To obtain the best effect, use this function when recording a person in close-up. Note that areas similar to the skin color may lack in detail.

Setting the Shutter Speed

You can adjust the shutter speed manually to make stable shots of fast moving subjects.

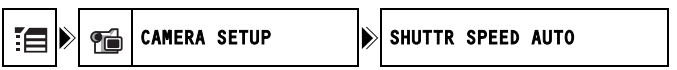
Available shutter speed settings:

CAMERA · AUTO, 1/50, 1/120, 1/250, 1/500, 1/1000, 1/2000

CAMERA · AUTO, 1/50, 1/120, 1/250

CAMERA · | PLAY · | CAMERA · | PLAY ·

MENU (📖 36)



1. **Set the program selector to P.**
2. **Press the FUNC. button to open the FUNC. menu.**
3. **With the joystick select (▲▼) the recording program icon and select (◀▶) the P [PROGRAM AE] program.**
4. **With the joystick select (▲▼) the icon and press (●).**
5. **Select (▲▼) the [CAMERA SETUP] menu and press (●). Then, select (▲▼) the [SHUTTR SPEED] option and press (●).**
6. **Select (▲▼) a setting option and press (●) to save the changes.**
7. **Press the FUNC. button to close the menu.**

- If the shutter speed is set to 1/500 or higher in CAMERA · mode and you switch to CAMERA · mode, it automatically changes to 1/250.
- Do not point the camcorder directly at the sun when the shutter speed is set to 1/1000 or higher.
- The image may flicker when recording with high shutter speeds.
- The shutter speed resets to [AUTO] when you set the program selector to EASY or when you change the recording program.
- Guidelines for Recording with High Shutter Speeds:
 - Outdoor sports such as golf or tennis: 1/2000
 - Moving objects such as cars or roller coasters: 1/1000, 1/500 or 1/250
 - Indoor sports such as basketball: 1/120

Auto Slow Shutter

In the ▢ Easy Recording mode or when the shutter speed is set to [AUTO] in the P Program AE recording program, the camcorder uses shutter speeds down to 1/25 (CAMERA · 📼) and 1/12.5 (CAMERA · 💿). This allows you to obtain a brighter recording in places with insufficient lighting. However, you can set the camcorder not to use a slow shutter speed.

CAMERA · 📼 | PLAY · 📼 | CAMERA · 💿 | PLAY · 💿

MENU (📖 36)

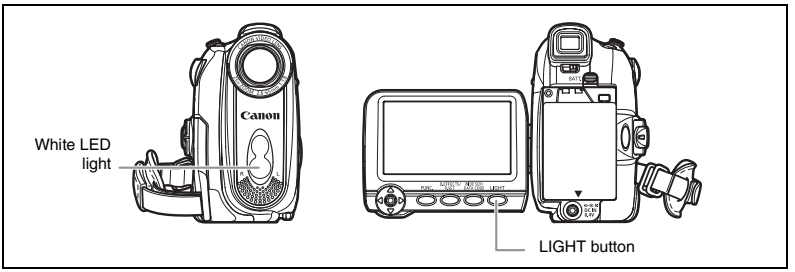


1. **Open the FUNC. menu, select (▲▼) the icon and press (●).**
2. **Select (▲▼) the [CAMERA SETUP] menu and press (●). Then, select (▲▼) the [A.SL SHUTTER] option and press (●).**
3. **Set (▲▼) it to [OFF] and press (●) to save the changes, then close the menu.**

- When set to [ON], moving subjects may leave a trailing afterimage.
- The camcorder retains the setting separately in CAMERA · 📼 and CAMERA · 💿 mode.
- If "📳" (camcorder shake warning) appears in CAMERA · 💿 mode, stabilize the camcorder, for example, by mounting it on a tripod or placing it on a table.

MV960/MV950 Using the LED Light

You can turn on the LED light at any time regardless of the recording program.



CAMERA · PLAY · | CAMERA · PLAY ·

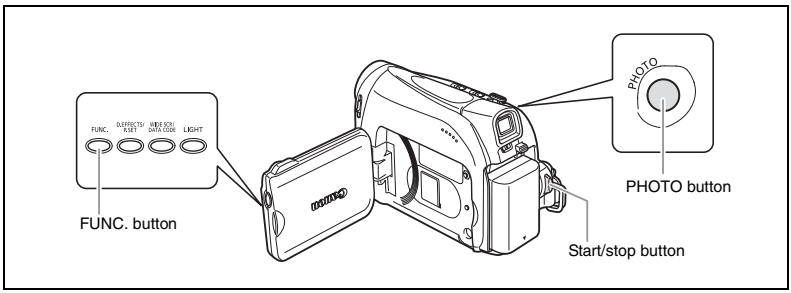
Press the LIGHT button.

- "☼" appears on the screen.
- The LED light turns on and off with each press of the button.

❍ Do not point the LED light at persons while they are driving.
❍ Do not look at the LED light for a long time.
❍ Do not use the LED light close to people's eyes.

Using the Self-Timer

The self-timer can be used for recording movies or still images.



CAMERA · | PLAY · | **CAMERA** · | PLAY ·

MENU (36)

OFF	SELF TIMER OFF

1. **Open the FUNC. menu and select (▲▼) the self timer icon.**
2. **Set (◀▶) it to [SELF TIMER ON] and close the menu.**

When recording movies:

3. **Press the start/stop button.**
 The camcorder starts recording after a 10-second countdown (2 seconds when using the START/STOP button of the wireless controller). The countdown appears on the screen.

When recording still images:

3. **Press the PHOTO button, first halfway to activate the autofocus and then fully.**
 The camcorder will record the image after a 10-second countdown (2 seconds when using the PHOTO button of the wireless controller). The countdown appears on the screen.

- ❍ To cancel the self timer, select (◀▶) [SELF TIMER OFF] in step 2 above. Once the countdown has begun, you can also press the start/stop button (when recording movies) or the PHOTO button (when recording still images) to cancel the self-timer.
- ❍ The self-timer will be canceled when you turn off the camcorder.

Changing the Recording Mode (SP/LP)

You can choose between SP (standard play) and LP (long play). LP extends the tape usage by 1.5 times.

CAMERA · 📼 | **PLAY · 📼** | CAMERA · 💾 | PLAY · 💾

MENU (📖 36)



1. **Open the FUNC. menu, select (▲▼) the icon and press (●).**
2. **Select (▲▼) the [VCR SETUP] menu and press (●). Then, select (▲▼) the [REC MODE] option and press (●).**
3. **Set (▲▼) it to [STD PLAY] or [LONG PLAY] and press (●) to save the changes, then close the menu.**

- **Tapes recorded in LP mode cannot be used for audio dubbing.**
- **Depending on the nature and usage condition of the tape, picture and sound recorded in LP mode may be distorted. We recommend using the SP mode for important recordings.**

- If you record in both SP and LP modes on the same tape, the playback picture may become distorted and the time code may not be written correctly.
- If you play back a tape that has been recorded in LP mode with another digital device on this camcorder, or vice versa, picture and sound may become distorted.

Changing the Audio Mode

You can record sound in two audio modes—16-bit and 12-bit. The 12-bit mode records sound on two channels (stereo 1), leaving 2 channels free (stereo 2) for adding new sound later. Select the 16-bit mode for higher sound quality.

CAMERA · PLAY · CAMERA · PLAY ·

MENU (📖 36)



1. **Open the FUNC. menu, select (▲▼) the icon and press (●).**
2. **Select (▲▼) the [AUDIO SETUP] menu and press (●). Then, select (▲▼) the [AUDIO MODE] option and press (●).**
3. **Set (▲▼) it to [16bit] or [12bit] and press (●) to save the changes, then close the menu.**
 The selected audio mode is displayed for approximately 4 seconds.

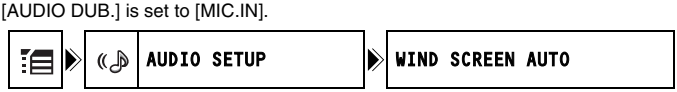
Wind Screen

The camcorder reduces the wind noise automatically. However, you can turn off the wind screen when recording indoors, or when you want the microphone to be as sensitive as possible.

CAMERA · PLAY · * CAMERA · PLAY ·

* Only when [AUDIO DUB.] is set to [MIC.IN].

MENU (📖 36)

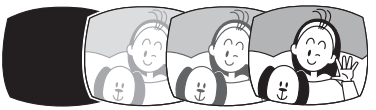


1. **Open the FUNC. menu, select (▲▼) the icon and press (●).**
2. **Select (▲▼) the [AUDIO SETUP] menu and press (●). Then, select (▲▼) the [WIND SCREEN] option and press (●).**
3. **Set (▲▼) it to [OFF] and press (●) to save the changes, then close the menu.**
 "OFF" appears when you turn the wind screen off.

Faders (📖 58)

Begin or end scenes with a fade to or from black.

Fade Trigger (FADE-T)



Wipe (WIPE)



Corner Wipe (CORNER)



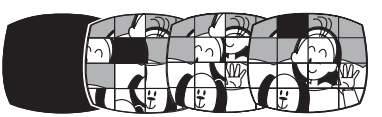
Jump (JUMP)



Flip (FLIP)



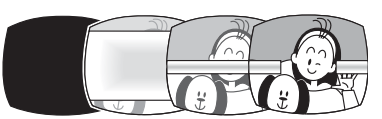
Puzzle (PUZZLE)



Zigzag (ZIGZAG)



Beam (BEAM)

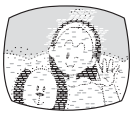
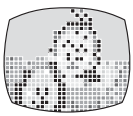


Tide (TIDE)



Effects (📖 58)

Add flavor to your recordings.

Black and White (BLK&WHT) 	**Sepia (SEPIA)** 	**Art (ART)** 
Mosaic (MOSAIC) 	**Ball (BALL)** 	**Cube (CUBE)** 
Wave (WAVE) 	**Color Mask (COLOR.)** 	**Mirror (MIRROR)** 

Card Mix (📖 59)

You can choose one of the sample images from the collection on the supplied disk (picture frames and backgrounds) and combine it with the live video recording. The live video recording will appear in place of the light area of the card mix image.



Availability of Digital Effects by Operating Modes:

	CAMERA · 📼		PLAY · 📼	CAMERA · 💾	PLAY · 💾
	Movies	Still Images			
Faders	○	×	○[1]	×	×
Effects	○	×	○[1]	○[2]	×
Card Mix	○	×	×	×	×

○: Available ×: Not available
[1] : Not available if the TV type is set to [NORMAL TV].
[2] : Black and White only.

Selecting a Fader

In CAMERA · 📼 mode, set the program selector to P.

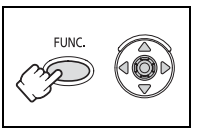
CAMERA · 📼 | PLAY · 📼 | CAMERA · 💿 | PLAY · 💿

MENU (📖 36)



1. **Open the FUNC. menu and select (▲▼) the digital effects icon.**
2. **Select (◀▶) the [FADER] option and press (●).**
3. **Select (◀▶) a setting option, press (●) and close the menu.**

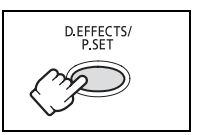
 The symbol of the selected fader will appear on screen.



CAMERA · 📼:

4. **Fade in: In record pause mode, press the D.EFFECTS button and begin recording by pressing the start/stop button.**
 Fade out: During recording, press the D.EFFECTS button and pause recording by pressing the start/stop button.

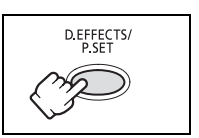
 The fader can be activated/deactivated by pressing the D.EFFECTS button.



PLAY · 📼:

4. **Fade in: In playback pause mode, press the D.EFFECTS button and begin playback by pushing the joystick (▲) towards ▶/❚❚.**
 Fade out: During playback, press the D.EFFECTS button and pause playback by pushing the joystick (▲) towards ▶/❚❚.

 The fader can be activated/deactivated by pressing the D.EFFECTS button.

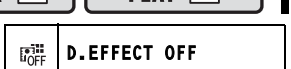


Selecting an Effect

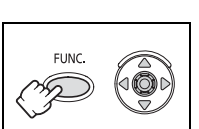
In CAMERA · 📼 mode, set the program selector to P.

CAMERA · 📼 | PLAY · 📼 | CAMERA · 💿 | PLAY · 💿

MENU (📖 36)



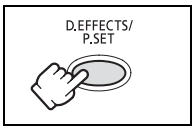
1. **Open the FUNC. menu and select (▲▼) the digital effects icon.**
2. **Select (◀▶) the [EFFECT] option and press (●).**
3. **Select (◀▶) a setting option, press (●) and close the menu.**



The symbol of the selected effect will appear on screen.

4. Press the D.EFFECTS button.

- The symbol of the selected effect will turn green.
- The effect can be activated/deactivated by pressing the D.EFFECTS button.



Selecting an Effect in CAMERA · Mode

When recording still images, only the [BLK&WHT] effect is available. Select it with the following procedure and activate it as described in step 4 above.

CAMERA · | PLAY · | **CAMERA ·** | PLAY ·

1. Open the menu and select (▲▼) the digital effects icon.

2. Select (◀▶) the E1 [BLK&WHT] option and close the menu.

"E1" will appear on screen.

Selecting the Card Mix Effect

CAMERA · | PLAY · | CAMERA · | PLAY ·

MENU (📖 36)

OFF	D.EFFECT OFF

1. Upload a sample image from the supplied disk to the memory card.

Refer to *Adding Still Images from Your Computer to the Memory Card* in the *Digital Video Software* instruction manual (PDF file).

2. Set the program selector to P.

3. Open the FUNC. menu and select (▲▼) the digital effects icon.

4. Select (◀▶) the [CARD MIX] option and press (joystick).

5. Select (◀▶) the still image to mix with the recording and push the joystick (▼) to adjust the mix level.

6. Adjust (◀▶) the mix level, press (joystick) and close the menu.

"🖼" will appear on screen.

7. Press the D.EFFECTS button.

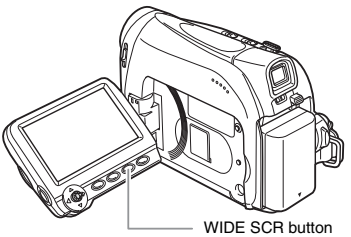
- "🖼" will turn green.
- The effect can be activated/deactivated by pressing the D.EFFECTS button.

❍ Turn off the digital effect when you do not use it.
❍ The camcorder retains the setting even if you turn it off or change the recording program. However, you need to select again the still image to be used with the Card Mix effect.
❍ The image quality may be slightly lower with digital effects.
❍ Digital effects cannot be used in the following cases:
- When the program selector is set to EASY.
- During DV dubbing.

❍ Faders cannot be used when Card Mix is activated.

Widescreen TV Recording (16:9)

The camcorder uses the full width of the CCD providing high-resolution 16:9 recording.



CAMERA · PLAY · CAMERA · PLAY ·

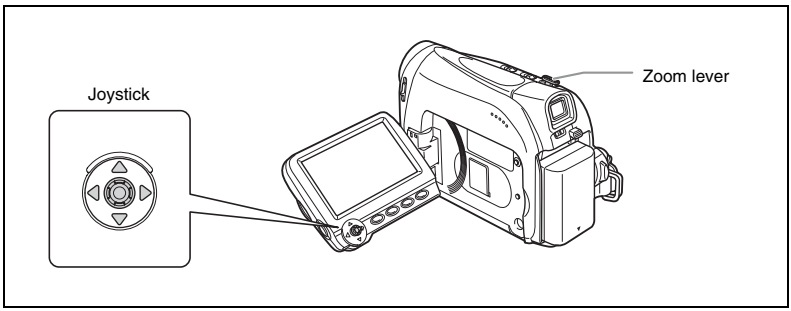
Press the WIDE SCR button.

- "WIDE" disappears and the picture changes to 4:3 aspect ratio.
- On the LCD screen: Widescreen video will display normally; video in 4:3 aspect ratio will appear with black side bars.
- On the viewfinder screen: Widescreen video will appear in "letterbox" display; video in 4:3 aspect ratio will display normally.

- ❍ Simultaneous recording on a memory card cannot be used when the widescreen mode is selected.
- ❍ Playing back recordings made in the widescreen mode on a normal TV: If the TV type is set to [NORMAL TV] the recording will be played back in "letterbox" display. If the TV type is set to [WIDE TV] the image will appear horizontally squeezed (📖 34).

Magnifying the Image

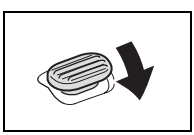
The playback image can be magnified up to 5 times.



CAMERA · PLAY · CAMERA · PLAY ·

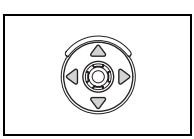
1. Move the zoom lever toward T.

- The image is magnified by 2 times.
- A frame appears indicating the position of the magnified area.
- To further enlarge the image, move the zoom lever toward **T**. To shrink the image below 2 times magnification, move the zoom lever toward **W**.



2. Select (▲▼, ◀▶) the magnified area with the joystick.

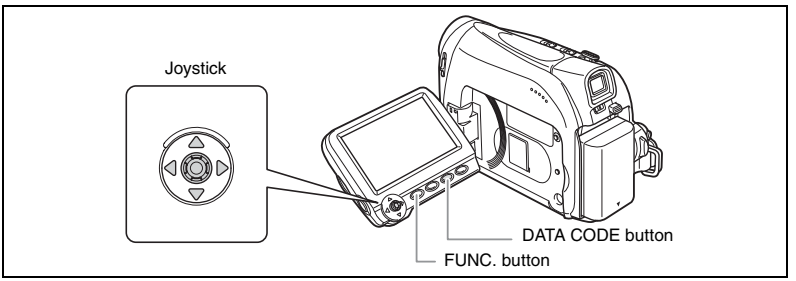
To cancel the magnification, move the zoom lever toward W until the frame disappears.



❍ Movies played back from a memory card cannot be magnified.
❍ While the magnification position frame is displayed it will replace the joystick guide. Cancel the magnification to return to normal playback of movies or still images.

Displaying the Data Code

The camcorder maintains a data code containing the recording date and time. You can select the data code combination and display it during playback.



CAMERA · PLAY · | CAMERA · PLAY ·

MENU (📖 36) → DISPLAY SETUP/ → DATA CODE DATE & TIME

1. **Open the FUNC. menu, select (▲▼) the icon and press (●).**
2. **Select (▲▼) the [DISPLAY SETUP/] menu and press (●). Then, select (▲▼) the [DATA CODE] option and press (●).**
3. **Select a setting option and press (●) to save the changes, then close the menu.**
4. **To display the data code during playback: Press the DATA CODE button.**

The data code will not display the next time you turn on the camcorder.

Six-Second Auto Date

Date and time appear for 6 seconds when you begin playback, or to indicate that date or time zone has changed.

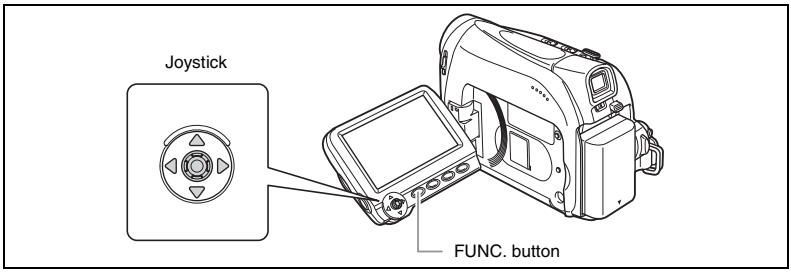
CAMERA · PLAY · | CAMERA · PLAY ·

MENU (📖 36) → DISPLAY SETUP/ → 6SEC.DATE OFF

1. **Open the FUNC. menu, select (▲▼) the icon and press (●).**
2. **Select (▲▼) the [DISPLAY SETUP/] menu and press (●). Then, select (▲▼) the [6SEC.DATE] option and press (●).**
3. **Select a setting option and press (●) to save the changes, then close the menu.**

End Search

When you have played back a tape, you can use this function to locate the end of the last recorded scene.



CAMERA · | **PLAY ·** | CAMERA · | PLAY ·

In stop mode:

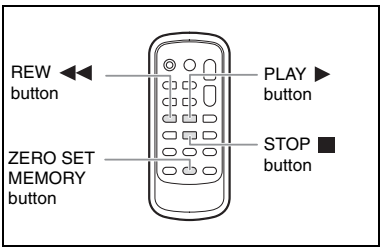
1. **Open the FUNC. menu, select (▲▼) the end search icon ➡▌ and press (●).**
2. **Select (◀▶) [EXECUTE] and press (●) to start the search.**
 - "END SEARCH" appears.
 - The camcorder rewinds/fast forwards the tape, plays back the last few seconds of the recording and stops the tape.
 - Operating the joystick (▲▼, ◀▶) will cancel the search.

❍ End search cannot be used once you unload the cassette.
❍ End search may not work properly if a blank section exists on the tape.
❍ You cannot use end search to locate the editing end of audio dubbing.

Returning to a Pre-marked Position

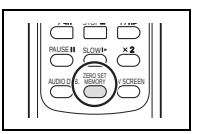
If you wish to return to a particular scene later, mark the point with the zero set memory and the tape will stop at that point when you rewind/fast forward the tape.

This function is operated with the wireless controller.



CAMERA · PLAY · CAMERA · PLAY ·

1. **Press the ZERO SET MEMORY button at the point you wish to return to later.**
 - "0:00:00 M" appears.
 - To cancel, press the ZERO SET MEMORY button again.
2. **When you have finished playback, rewind the tape.**
 - "◀◀" or "▶▶" is displayed with a blue background.
 - The tape stops automatically at "0:00:00".
 - The tape counter changes to time code.

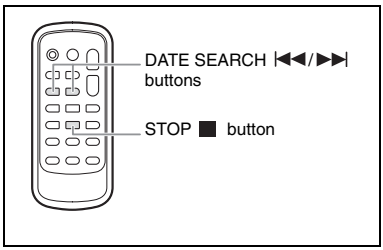


The zero set memory may not function correctly when the time code has not been recorded consecutively.

Date Search

You can locate the change of the date/time zone with the date search function.

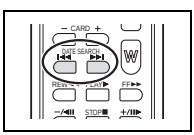
This function is operated with the wireless controller.



CAMERA · | **PLAY ·** | CAMERA · | PLAY ·

Press the ⏮ or ⏭ button to begin searching.

- Press more than once to search for further date changes (up to 10 times).
- Press the STOP ■ button to stop searching.



❍ A recording of longer than a minute per date/area is required.
❍ Date search may not function if the data code is not correctly displayed.

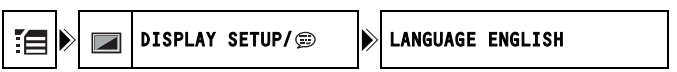
Changing the Display Language

The language used for screen display and menu items can be changed. The available set of languages varies depending on the region. Follow the procedure below to check which set of languages are provided with your camcorder.

Language Set A	English, German, Spanish, French, Italian, Polish, Russian, Simplified Chinese, Japanese
Language Set B	English, Simplified Chinese, Traditional Chinese, Thai

CAMERA · 📼 | PLAY · 📼 | CAMERA · 💿 | PLAY · 💿

MENU (📖 36)



1. **Open the FUNC. menu, select (▲▼) the icon and press (●).**
2. **Select (▲▼) the [DISPLAY SETUP/] menu and press (●). Then, select (▲▼) the [LANGUAGE] option and press (●).**
3. **Select a language and press (●) to save the changes, then close the menu.**

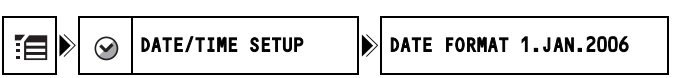
- If you have mistakenly changed the language, follow the mark next to the menu item to change the setting.
- The displays “FUNC.” and “P.SET” at the bottom of the screen refer to the button names on the camcorder and will not change when you change the language.

Changing the Date Format

You can select between three date formats. For example, [1. JAN. 2006], [JAN. 1, 2006] and [2006. 1. 1].

CAMERA · 📼 | PLAY · 📼 | CAMERA · 💿 | PLAY · 💿

MENU (📖 36)



1. **Open the FUNC. menu, select (▲▼) the icon and press (●).**
2. **Select (▲▼) the [DATE/TIME SETUP] menu and press (●). Then, select (▲▼) the [DATE FORMAT] option and press (●).**
3. **Select a setting option and press (●) to save the changes, then close the menu.**

Beep

You will hear a beep upon camcorder operations such as power on/off, start/stop, self-timer countdown, and unusual conditions of the camcorder. If you turn off the beep, all camcorder sounds will be turned off.

CAMERA · 📼 | PLAY · 📼 | CAMERA · 💿 | PLAY · 💿

MENU (📖 36) → SYSTEM SETUP → BEEP HIGH VOLUME

To turn off the beep:

1. **Open the FUNC. menu, select (▲▼) the icon and press (●).**
2. **Select (▲▼) the [SYSTEM SETUP] menu and press (●). Then, select (▲▼) the [BEEP] option and press (●).**
3. **Set it to [OFF] and press (●) to save the changes, then close the menu.**

Adjusting the Brightness of the LCD Screen

CAMERA · 📼 | PLAY · 📼 | CAMERA · 💿 | PLAY · 💿

MENU (📖 36) → DISPLAY SETUP/💬 → BRIGHTNESS −▬▬▬+

1. **Open the FUNC. menu, select (▲▼) the icon and press (●).**
2. **Select (▲▼) the [DISPLAY SETUP/💬] menu and press (●). Then, select (▲▼) the [BRIGHTNESS] option and press (●).**
3. **Adjust (◀▶) the brightness level and press (●) to save the changes, then close the menu.**

Changing the brightness of the LCD screen does not affect that of the viewfinder or the recordings.

Turning the Remote Sensor Off

CAMERA · 📼 | PLAY · 📼 | CAMERA · 💿 | PLAY · 💿

MENU (📖 36) → SYSTEM SETUP → WL.REMOTE ON

1. **Open the FUNC. menu, select (▲▼) the icon and press (●).**
2. **Select (▲▼) the [SYSTEM SETUP] menu and press (●). Then, select (▲▼) the [WL.REMOTE] option and press (●).**
3. **Set it to [OFF] and press (●) to save the changes, then close the menu.**
 "📡" appears.

Turning Off the Image Stabilizer

The image stabilizer compensates for camcorder shake even at full telephoto. It tries to compensate for horizontal movements; therefore, you may decide to turn it off when you mount the camcorder on a tripod.

CAMERA · | PLAY · | CAMERA · | PLAY ·

MENU (📖 36) → CAMERA SETUP → IMG STAB ON

1. **Open the FUNC. menu, select (▲▼) the icon and press (⊛).**
2. **Select (▲▼) the [CAMERA SETUP] menu and press (⊛). Then, select (▲▼) the [IMG STAB] option and press (⊛).**
3. **Set it to [OFF] and press (⊛) to save the changes, then close the menu.**

"((✋))" disappears.

- The image stabilizer cannot be turned off when the program selector is set to EASY.
- The image stabilizer is designed to compensate a normal degree of camcorder shake.
- The image stabilizer might not be as effective when using the Night recording program.

Changing the Display of the Start-Up Image

You can set whether the Canon logo will be displayed or not when you turn on the camcorder.

CAMERA · | PLAY · | CAMERA · | PLAY ·

MENU (📖 36) → SYSTEM SETUP → START-UP IMG ON

To turn off the start-up image:

1. **Open the FUNC. menu, select (▲▼) the icon and press (⊛).**
2. **Select (▲▼) the [SYSTEM SETUP] menu and press (⊛). Then, select (▲▼) the [START-UP IMG] option and press (⊛).**
3. **Set it to [OFF] and press (⊛) to save the changes, then close the menu.**

Demonstration Mode

The demonstration mode displays the camcorder's main features. It starts automatically when you leave the camcorder turned on (using the power adapter) without loading a recording media for more than 5 minutes. However, you can set the camcorder not to start the demonstration mode.

CAMERA · PLAY · CAMERA · PLAY ·

MENU (📖 36) → DISPLAY SETUP/ → DEMO MODE ON

To deactivate the demonstration mode:

1. **Open the FUNC. menu, select (▲▼) the icon and press ().**
2. **Select (▲▼) the [DISPLAY SETUP/] menu and press (). Then, select (▲▼) the [DEMO MODE] option and press ().**
3. **Set it to [OFF] and press () to save the changes, then close the menu.**

To cancel the demo mode once it has begun, press any button, turn off the camcorder or load a recording media.

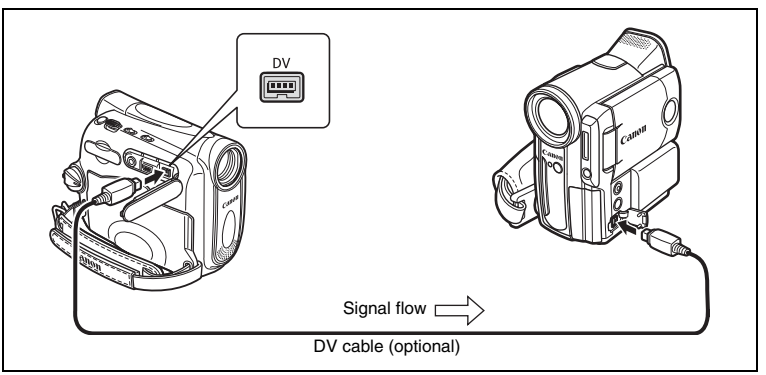
Recording to a VCR or Digital Video Device

You can copy your recordings by connecting the camcorder to a VCR or a digital video device. If you connect a digital video device, you can copy recordings with virtually no generation loss in image and sound quality.

Connecting the Devices

① **Connecting a VCR**
See *Playing Back on a TV Screen* (🕮 32).

② **Connecting a Digital Video Device**
Use the optional CV-150F (4 pin-4 pin) or CV-250F (4 pin-6 pin) DV Cable.
Refer also to the instruction manual of the digital video device.



Recording

CAMERA · | **PLAY ·** | CAMERA · | PLAY ·

1. **Set the camcorder to PLAY · mode and load a recorded cassette.**
2. **Connected device: Load a blank cassette and set the device to record pause mode.**
3. **Locate the scene you wish to copy and pause playback shortly before the scene.**
4. **Play back the tape.**
5. **Connected device: Begin recording when the scene you wish to copy appears. Stop recording when copying is complete.**
6. **Stop playback.**

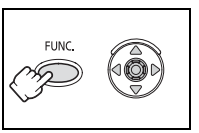
❍ We recommend powering the camcorder from a household power source.
❍ When connecting a VCR, the quality of the edited tape will be slightly lower than that of the original.
❍ When connecting a digital video device:
- If the picture does not appear, reconnect the DV cable or turn the camcorder off and back on again.
- Proper operation cannot be guaranteed for all digital video devices equipped with a DV terminal. If operation does not work, use the AV terminal.

MV960 Recording from Analog Video Devices (VCR, TV or Camcorder)

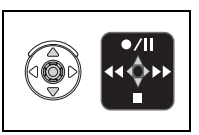
You can record videos or TV programs from a VCR or analog camcorder on the tape in the camcorder.

CAMERA · | **PLAY ·** | CAMERA · | PLAY ·

1. **Connect the camcorder to the analog video device.**
 See *Playing Back on a TV Screen* (🕮 32).
2. **Set the camcorder to PLAY · mode and load a blank cassette.**
3. **Connected device: Load the recorded cassette.**
4. **Open the FUNC. menu, select (▲▼) the record pause icon ●❚❚ and press ().**
5. **Select (◀▶) [EXECUTE] and press ().**
 In record pause and during recording, you can check the picture on the screen.



6. **Connected device: Play back the tape.**
7. **If the joystick guide does not appear on screen, press () to display it.**
8. **Push the joystick (▲) towards ●/❚❚ when the scene you wish to record appears.**
 - Recording starts.
 - Push the joystick (▲) towards ●/❚❚ again to pause/resume the recording.
9. **Push the joystick (▼) towards ■ to stop recording.**
10. **Connected device: Stop playback.**



- ❍ When connecting to a TV/Video with SCART terminal, use a SCART adapter with input capability (commercially available). The supplied SCART Adapter PC-A10 is for output only.
- ❍ Depending on the signal sent from the connected device, dubbing may not work properly (e.g. signals that include copyright protective signals or anomalous signals such as ghost signals).

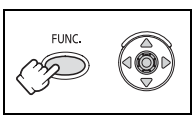
We recommend powering the camcorder from a household power source.

MV960/MV940 Recording from Digital Video Devices (DV Dubbing)

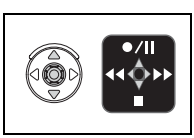
You can record from other digital video devices equipped with a DV terminal with virtually no loss in picture and sound quality.

CAMERA · | **PLAY ·** | CAMERA · | PLAY ·

1. **Connect the camcorder to the digital video device.**
 See *Connecting a Digital Video Device* (📖 70).
2. **Set the camcorder to PLAY · mode and load a blank cassette.**
 MV960 Make sure that [AV➡DV] is set to [OFF] (📖 76).
3. **Connected device: Load the recorded cassette or disc.**
4. **Open the FUNC. menu, select (▲▼) the recording pause icon ●❚❚ and press (⊛).**
5. **Select (◀▶) [EXECUTE] and press (⊛).**
 In record pause and during recording, you can check the picture on the screen.



6. **Connected device: Play back the tape or disc.**
7. **If the joystick guide does not appear on screen, press (⊛) to display it.**
8. **Push the joystick (▲) towards ●/❚❚ when the scene you wish to record appears.**
 - Recording starts.
 - Push the joystick (▲) towards ●/❚❚ again to pause/resume the recording.



9. **Push the joystick (▼) towards ■ to stop recording.**
10. **Connected Device: Stop playback.**

- ❍ Blank sections may be recorded as anomalous picture.
- ❍ If the picture does not appear, reconnect the DV cable or turn the camcorder off and back on again.
- ❍ You can only record video signals from devices with the DV logo from recordings in SD (standard definition) standard, in SP or LP recording mode. Note that signals from identically shaped DV (IEEE1394) terminals may be in different video standards.

We recommend powering the camcorder from a household power source.

Concerning Copyright

Copyright Precaution

Certain pre-recorded video tapes, films and other materials, as well as some television programmes are copyrighted. Unauthorised recording of these materials may violate copyright protection laws.

Copyright Signals

During playback: If you try to play back a tape that contains copyright control signals for protection of software, “COPYRIGHT PROTECTED PLAYBACK IS RESTRICTED” appears for a few seconds and the camcorder displays a blank blue screen. You cannot playback the contents of the tape.

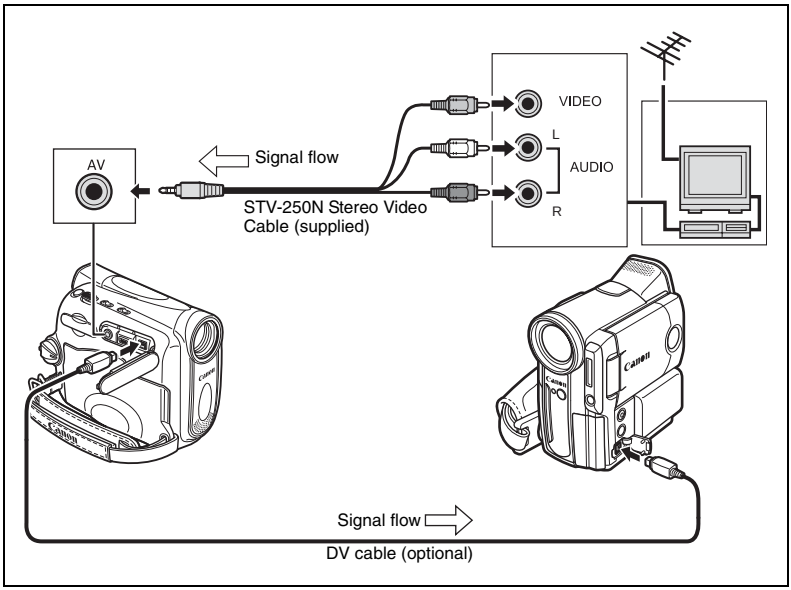
During recording: If you try to record from software that contains copyright control signals for protection of software, “COPYRIGHT PROTECTED DUBBING RESTRICTED” appears. You cannot record the contents of the software.
You cannot record copyright protection signals to a tape using this camcorder.

MV960 Converting Analog Signals into Digital Signals (Analog-Digital Converter)

By connecting the camcorder to a VCR or 8mm video camcorder, you can convert analog video/audio signals to digital signals and output the digital signals via the DV terminal. The DV terminal serves as output terminal only.

Connecting the Devices

Turn off all the devices before starting the connections. Unload the tape from the camcorder. Refer also to the instruction manual of the connected device. Use the optional CV-150F (4 pin-4 pin) or CV-250F (4 pin-6 pin) DV Cable.



Turning On the Analog-Digital Converter

CAMERA · | **PLAY ·** | CAMERA · | PLAY ·

MENU (📖 36)



1. **Open the FUNC. menu, select (▲▼) the icon and press (●).**
2. **Select (▲▼) the [VCR SETUP] menu and press (●). Then, select (▲▼) the [AV➡ DV] option and press (●).**
3. **Set it to [ON] and press (●) to save the changes, then close the menu.**

- ❍ Depending on the signal sent from the connected device, the conversion from analog to digital signals might not work properly (e.g., signals that include copyright protective signals or anomalous signals such as ghost signals).
- ❍ When connecting to a TV/Video with SCART terminal, use a SCART adapter with input capability (commercially available). The supplied SCART Adapter PC-A10 is for output only.
- ❍ For normal use, set [AV➡ DV] to [OFF]. If it is set to [ON], digital signals cannot be input via the camcorder's DV terminal.
- ❍ Depending on the software and the specifications of your computer, you may not be able to transfer converted signals via the DV terminal.

We recommend powering the camcorder from a household power source.

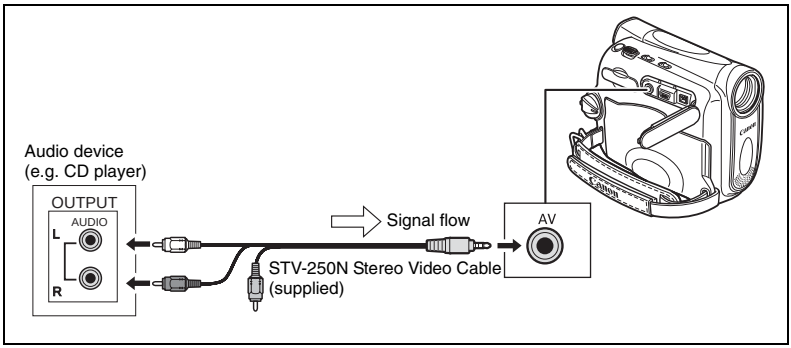
MV960/MV940 Audio Dubbing

You can add sound to a recording using the built-in microphone (MIC.IN). MV960 only: You can also record additional sound from external audio devices (AUDIO IN).

This function is operated with the wireless controller.

MV960 Connecting an External Audio Device

Refer also to the instruction manual of the connected device.

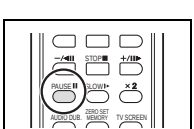


Dubbing

CAMERA · | **PLAY ·** | CAMERA · | PLAY ·

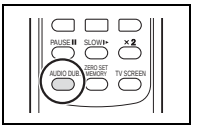
MENU (📖 36) → **AUDIO SETUP** → **AUDIO DUB. AUDIO IN**

1. **Set the camcorder to PLAY · mode and load a recorded cassette.**
 Use a tape recorded in SP, 12-bit mode with this camcorder.
2. **Open the FUNC. menu, select (▲▼) the icon and press (⊛).**
3. **Select (▲▼) the [AUDIO SETUP] menu and press (⊛). Then, select (▲▼) the [AUDIO DUB.] option and press (⊛).**
4. **Set it to [AUDIO IN] or [MIC.IN] and press (⊛) to save the changes, then close the menu.**
 MV940 : Make sure the [MIC.IN] setting is selected.
5. **Locate the scene you wish to start audio dubbing.**
6. **Press the PAUSE ❚❚ button on the wireless controller.**



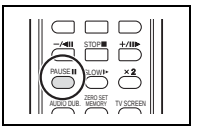
7. Press the AUDIO DUB. button on the wireless controller.

"AUDIO DUB." and "⏷ ❚❚" appear.



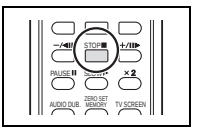
8. Press the PAUSE ❚❚ button on the wireless controller to begin dubbing.

- MV960 Audio device: Begin playback.
- Microphone: Speak into the microphone.



9. Press the STOP ■ button on the wireless controller to stop dubbing.

MV960 Audio device: Stop playback.



❍ Use only tapes recorded in SP mode 12-bit audio sound with this camcorder. Audio dubbing will stop if the tape has a blank section or a section recorded in LP mode or 16-bit mode.
❍ You cannot use the DV terminal for audio dubbing.
❍ If you add sound to a tape not recorded with this camcorder, sound quality may decrease.
❍ Sound quality may decrease when you add sound to the same scene for more than 3 times.

❍ When you connect an audio device, check the picture on the LCD screen and the sound via built-in speaker or audio device.
❍ When you use the microphone, you can check the picture on a TV connected via the AV terminal and the sound via headphones connected to the TV.
❍ Set the zero set memory at the end of the scene you wish to audio dub. The camcorder will automatically stop audio dubbing at that point.

Playing Back the Added Sound

You can select to play back Stereo 1 (original sound), Stereo 2 (added sound), or adjust the balance of both sounds.

CAMERA · | **PLAY ·** | CAMERA · | PLAY ·

MENU (36) → AUDIO SETUP → 12bit AUDIO STEREO1

1. **Open the FUNC. menu, select (▲▼) the icon and press (●).**
2. **Select (▲▼) the [AUDIO SETUP] menu and press (●). Then, select (▲▼) the [12bit AUDIO] option and press (●).**
3. **Select a setting option and press (●) to save the changes.**
 - STEREO1: Plays back the original sound.
 - STEREO2: Plays back the added sound.
 - MIX/FIXED: Plays back Stereo 1 and Stereo 2 in the same level.
 - MIX/VAR.: Plays back Stereo 1 and Stereo 2. The mix balance can be adjusted.
 - If you select an audio setting other than [MIX/VAR.], close the menu.

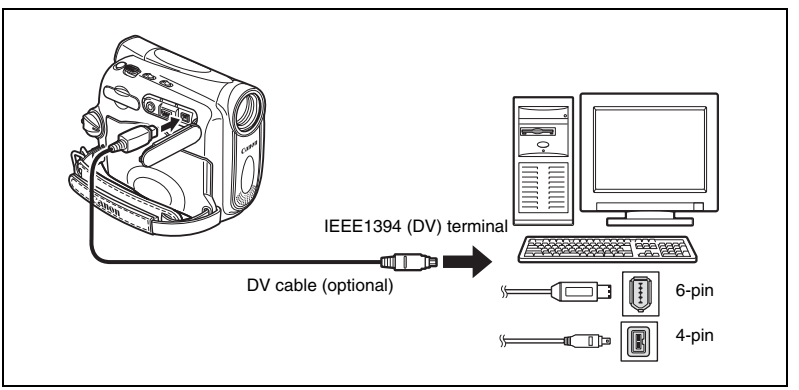
To adjust the mix level when you select [MIX/VAR.]:

4. **From the [AUDIO SETUP] menu select (▲▼) the [MIX BALANCE] option and press (●).**
5. **Adjust (◀▶) the mix level between ST-1 and ST-2 and press (●) to save the changes, then close the menu.**

The camcorder resets to [STEREO1] when you turn the camcorder off. However, the mix balance is memorized by the camcorder.

Transferring Using a DV Cable

You can transfer recordings to a computer equipped with a IEEE1394 (DV) terminal or IEEE1394 capture board. Use the editing software supplied with your computer/capture board to transfer video recording from tape to computer. Refer to the instruction manual of the software. A driver is preinstalled on Windows operating systems later than Windows 98 Second Edition and Mac operating systems later than Mac OS 9, and will be installed automatically.
Use the optional CV-150F (4 pin-4 pin) or CV-250F (4 pin-6 pin) DV Cable.

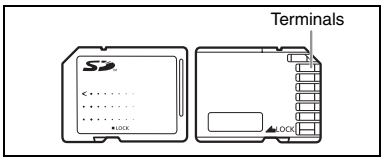


- ❍ Operation may not work correctly depending on the software and the specifications/settings of your computer.
- ❍ If the computer freezes while you have connected the camcorder, disconnect and reconnect the DV cable. If the problem persists, disconnect the interface cable, turn off camcorder and computer, turn camcorder and computer back on and reconnect them.
- ❍ Make sure that camcorder and computer are not connected with a USB cable before connecting the camcorder to the computer using the DV cable. Otherwise, the computer may not operate properly.

- ❍ We recommend powering the camcorder from a household power source while it is connected to the computer.
- ❍ Refer also to the instruction manual of the computer.

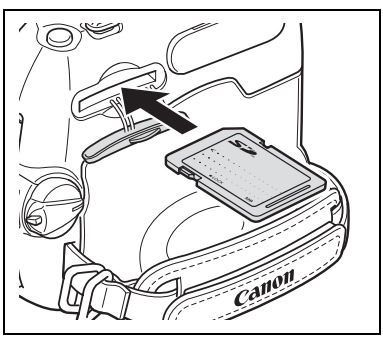
Inserting and Removing a Memory Card

You can use commercially available SD SD Memory Cards or MultiMediaCards (MMC) with this camcorder. The SD Memory Card has a protect switch to prevent accidental erasure. Memory cards have front and back sides that are not interchangeable. Inserting a memory card facing the wrong direction can cause a malfunction of the camcorder.



Inserting the Card

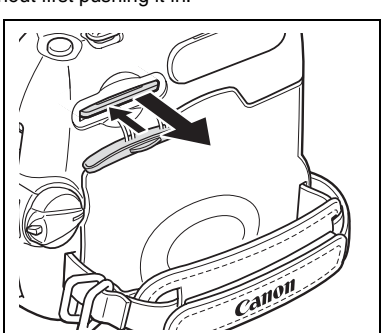
1. **Turn off the camcorder.**
2. **Open the cover.**
3. **Insert the memory card all the way into the memory card slot.**
4. **Close the cover.**
 If the memory card is not correctly inserted the cover will not close - do not forcefully close the cover. Verify that the memory card is inserted in the correct direction.
5. **Turn on the camcorder.**



Removing the Card

Do not forcefully remove the memory card without first pushing it in.

1. **Turn off the camcorder.**
 Make sure that the CARD access indicator is not flashing before you turn off the camcorder.
2. **Open the cover.**
3. **Push the memory card to release it. Remove the memory card.**
4. **Close the cover.**



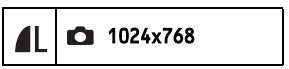
- ❍ This camcorder is compatible with SD Memory Cards or MultiMediaCards only. Do not use any other types of memory cards.
- ❍ Proper operation cannot be guaranteed for all memory cards.
- ❍ Turn off the camcorder before inserting or removing the memory card. Otherwise, it may result in data damage.
- ❍ Initialize new memory cards with the camcorder (🕮 96).

Selecting the Image Quality/Size

You can select the still image size from **L** 1024x768 or **S** 640x480 and the still image quality from Super Fine, Fine and Normal.

CAMERA · | PLAY · | **CAMERA ·** | PLAY ·

MENU (📖 36)



1. **Open the FUNC. menu and select (▲▼) the image size/quality icon.**
2. **Select (◀▶) the desired image size.**
 The number on the right indicates the approximate number of images that can be recorded on the memory card at the current image size/quality setting.
3. **If you want to change also the image quality: Press (⊛) and select (◀▶) the desired image quality.**
 - The number on the right indicates the approximate number of images that can be recorded on the memory card at the current image size/quality setting.
 - You can press (⊛) again to go back to select the image size (step 2).
4. **Close the menu.**

❍ Still images are recorded with JPEG compression.
❍ Number of still images 📷 that can be recorded on a memory card:

Image Size	Image Quality	Number of Images			File Size per Image
		16MB	128MB	512MB	
L 1024X768	Super Fine	30	270	1075	440KB
	Fine	40	400	1585	304KB
	Normal	85	760	3015	160KB
S 640X480	Super Fine	75	690	2740	176KB
	Fine	105	955	3770	120KB
	Normal	170	1525	6035	72KB

These figures are approximate. They vary according to the recording condition and the subject.

Changing the Still Image Quality during a Tape's Playback

While playing back a tape you can capture a scene as a still image on the memory card. In PLAY · 📼 the still image size will be **S** 640x480, but you can select the still image quality.

CAMERA · 📼 | **PLAY · 📼** | CAMERA · 💳 | PLAY · 💳

MENU (📖 36)



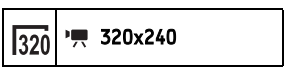
1. **Open the FUNC. menu and select (▲▼) the image quality icon.**
2. **Select (◀▶) the desired image quality.**
 - The still image size is **S** 640x480 and cannot be changed.
 - The number on the right indicates the approximate number of images that can be recorded on the memory card at the current image quality setting.
3. **Close the menu.**

Changing the Movie Size

You can choose between 320 x 240 pixels and 160 x 120 pixels.

CAMERA · 📼 | **PLAY · 📼** | **CAMERA · 💳** | PLAY · 💳

MENU (📖 36)



1. **Open the FUNC. menu and select (▲▼) the movie size icon.**
2. **Select (◀▶) a setting option and close the menu.**

❍ Movies are recorded with Motion JPEG compression.
❍ Maximum recording time of a movie 🎬 on a memory card:

Image Size	Recording Time			File Size per Second
	16MB	128MB	512MB	
320 320 x 240	50 sec.	8 min.	32 min.	250KB
160 160 x 120	1 min.	17 min.	67 min.	120KB

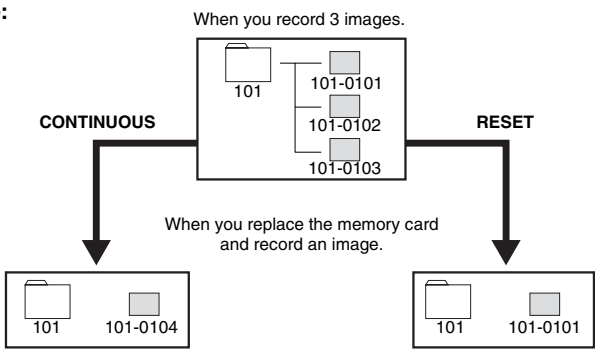
File Numbers

Images are automatically assigned file numbers from 0101 to 9900 and stored in folders containing up to 100 images. Folders are assigned numbers from 101 to 998.

You can choose to use consecutive file numbers (CONTINUOUS) or to reset the file number each time a different memory card is inserted (RESET). We recommend setting the file numbers to CONTINUOUS.

RESET	The file number will be reset each time a new memory card is inserted, starting with 101-0101. If the memory card already contains image files, the consecutive file number will be assigned.
CONTINUOUS	The camcorder memorizes the file number of the last image and assigns the consecutive file number to the next image, even when a new memory card is inserted. (If a higher file number already exists on the memory card, the consecutive number will be assigned.) There will be no duplication of file numbers. This is useful for organizing images on a computer.

Example:



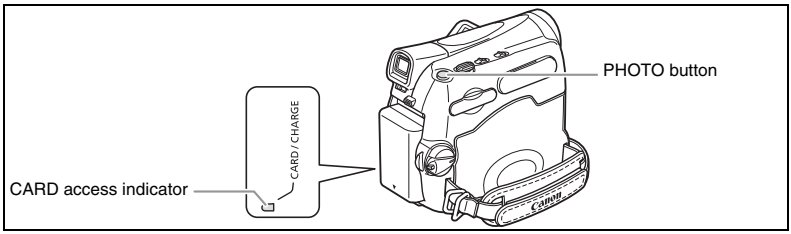
CAMERA · PLAY · | CAMERA · PLAY ·

MENU (📖 36) → SYSTEM SETUP → FILE NOS. CONTINUOUS

1. **Open the FUNC. menu, select (▲▼) the icon and press (●).**
2. **Select (▲▼) the [SYSTEM SETUP] menu and press (●). Then, select (▲▼) the [FILE NOS.] option and press (●).**
3. **Select a setting option and press (●) to save the changes, then close the menu.**

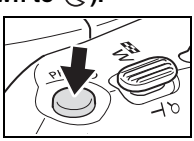
Recording Still Images on a Memory Card

You can record still images with the camcorder or record as still images scenes from a video recording on the tape or from an external video signal from the DV terminal (***MV960*** only: also from the AV terminal). You can also record a still image on the memory card while you record a movie on the tape.

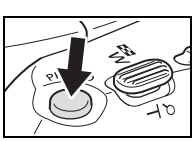


CAMERA · PLAY · **CAMERA ·** PLAY ·

1. **Set the camcorder to CAMERA · mode.**
2. **Open the lens cover (move the lens cover switch down to).**
3. **Press the PHOTO button halfway.**
 - turns green when focus is adjusted and a green frame appears. The beep sounds.
 - When you press the PHOTO button on the wireless controller, recording starts immediately.



4. **Press the PHOTO button fully.**
 - and the focusing frame disappear and you hear a shutter sound.
 - The CARD access indicator flashes and the card access display appears.
 - The still image shown on the screen will be recorded on the memory card.



❍ Do not turn off the camcorder, change the position of the TAPE/CARD switch, disconnect the power source, open the memory card cover or remove the memory card while the CARD access indicator is flashing. Doing so could result in data damage.

❍ When you are using an SD Memory Card, make sure that the protect switch is set to allow recording.

- Connection to a computer or PictBridge compliant printer will not work when the memory card contains more than 1800 images. For best performance, we recommend not recording more than 100 images on the memory card when you plan to connect the camcorder to a computer or printer.
 When you are using a Macintosh computer, you may not be able to download image with ImageBrowser or with OS standard software when the memory card contains more than 1000 images. In such case, use a card reader for downloading the images.
- **When the Focus-Priority mode is set to [ON: AiAF] or [ON: CENTER]:**
 When you press the PHOTO button fully before ● and the focusing frame turn green, it may take up to 2* seconds until focus is adjusted and the still image can be recorded to the memory card.
 * Up to 4 seconds in the Night recording program.
 If the subject is not suitable for autofocus, the focusing frame turns yellow and locks the focus. Adjust the focus manually with the joystick.
- When powered by a battery pack, the camcorder shuts off to save power if left without any operation for 5 minutes. Approximately 30 seconds before the camcorder shuts off the message "⚠ AUTO POWER OFF" will appear. To continue recording, turn the POWER switch to OFF and then back to CAMERA.

Recording a Still Image on a Memory Card While Recording Movies on a Tape

When you are recording a movie on a tape, you can record the same picture as a still image on the memory card. Select the image quality from normal or fine.

CAMERA · 📼 | PLAY · 📼 | CAMERA · 🖼 | PLAY · 🖼

MENU (📖 36)

OFF | 📷 STILL IMG REC OFF

1. **Open the FUNC. menu and select (▲▼) the still image recording icon.**
2. **Select a setting option other than [OFF 📷 STILL IMG REC OFF] and close the menu.**
3. **While you are recording a movie, press the PHOTO button.**

- The size of the still image will be **S** 640 x 480.
- The quality of the still image is slightly lower than a still image recorded in CAMERA · 🖼 mode.
- The still image cannot be recorded on the memory card if a digital effect is activated or while recording in widescreen mode.
- "OFF 📷" appears when you press the PHOTO button when the still image recording is set to [OFF 📷 STILL IMG REC OFF].

Recording from a Tape in the Camcorder

CAMERA · 📼 | **PLAY · 📼** | CAMERA · 💾 | PLAY · 💾

1. **Play back the tape.**
2. **Press the PHOTO button halfway when the scene you wish to record appears.**
 - The camcorder pauses playback. The remaining image capacity and other information appear.
 - When you press the PHOTO button on the wireless controller, recording starts immediately.
3. **Press the PHOTO button fully.**
 - The CARD access indicator flashes.
 - You can also record a still image by pressing the PHOTO button fully when the tape is in playback pause mode.

MV960 / MV940 Recording from Other Video Devices

You can record as still images on the memory card scenes captured from external video devices connected through the DV terminal. *MV960* only: you can also use the analog to digital conversion to input video through the AV terminal. For connecting instructions, refer to pages 32 and 70.

CAMERA · 📼 | **PLAY · 📼** | CAMERA · 💾 | PLAY · 💾

1. **Set the camcorder to PLAY · 📼 mode.**
 - If a cassette is loaded, make sure that the tape is stopped.
 - *MV960* When recording via the AV terminal, make sure that "AV➡DV" is displayed on the screen. When recording via the DV terminal, make sure that "AV➡DV" is not displayed. Change the setting as necessary (📖 76).
2. **Connected device: Load a recorded cassette and play back the tape.**
3. **Press the PHOTO button halfway when the scene you wish to record appears.**
 - The still image, remaining image capacity and other information appear.
 - When you press the PHOTO button on the wireless controller, recording starts immediately.
4. **Press the PHOTO button fully.**
 The CARD access indicator flashes.

❍ When recording from a tape in the camcorder or other video devices:
- A still image recorded from an image in widescreen mode will be vertically compressed.
- The data code of the still image will reflect the date and time it has been recorded on the memory card.
- The size of the still image will be **S** 640 x 480.

❍ When connecting with a DV cable, make sure that no USB cable is connected to the camcorder.

Reviewing a Still Image Right after Recording

You can select to display a still image for 2, 4, 6, 8 or 10 seconds after it has been recorded.

CAMERA · | PLAY · | **CAMERA ·** | PLAY ·

MENU (📖 36) → CAMERA SETUP → REVIEW 2sec

1. **Open the FUNC. menu, select (▲▼) the icon and press (●).**
2. **Select (▲▼) the [CAMERA SETUP] menu and press (●). Then, select (▲▼) the [REVIEW] option and press (●).**
3. **Select a setting option and press (●) to save the changes, then close the menu.**

- ❍ A still image is displayed as long as you hold the PHOTO button after recording.
- ❍ If you press the FUNC. button while you are reviewing the still image immediately after recording it, a menu appears where you have the option to protect (📖 94) or erase (📖 95) the image you just recorded.

Screen Displays during Still Image Recording



① Remaining Card Capacity for Still Images

- flashing in red: No card
- in green: 6 or more images
- in yellow: 1 to 5 images
- in red: No more images
- The indication may not decrease even though a recording has been made, or may decrease by 2 images at once.
- All indicators are displayed in green when a memory card is played back.

"▶" Card Access Display

Indicates that the camcorder is writing on the memory card.

② Still Image Size and Quality

Indicates the size and quality of the still image.

Recording Movies on a Memory Card

You can record Motion JPEG movies with the camcorder, from a tape in the camcorder or from devices connected via the DV terminal or the AV terminal. The sound of a movie recorded on a memory card will be monaural.

CAMERA · | PLAY · | **CAMERA · CARD** | PLAY · CARD

1. **Select the movie size for recording on the card: Open the FUNC. menu and select (▲▼) the movie size icon. Select (◀▶) a setting option other than the default [MOVIE REC OFF] and close the menu.**
2. **Press the start/stop button to begin recording.**
 With SD Memory Cards up to 2 GB, you can record until “CARD FULL” appears (approx. 32 minutes with a 512 MB SD Memory Card). With MultiMediaCards, the recording time is limited to 10 sec. in 320 x 240 pixels or 30 sec. in 160 x 120 pixels.
3. **Press the start/stop button to stop recording.**



- ❍ Do not turn off the camcorder, change the position of the TAPE/CARD switch, disconnect the power source, open the memory card cover or remove the memory card while the CARD access indicator is flashing. Doing so could result in data damage.
- ❍ When you are using an SD Memory Card, make sure that the protect switch is set to allow recording.
- ❍ Do not load/unload a cassette during recording.



- ❍ We recommend using a Canon SD Memory Card, or an SD Memory Card with a transfer rate of more than 2 MB/sec., right after initializing it with this camcorder. With memory cards not initialized with this camcorder, or when recording/erasing has been repeatedly performed, the writing speed may be lower and recording may stop.
- ❍ You can select the focusing point when recording a movie on the memory card.
- ❍ Users of Windows XP: When you plan to connect the camcorder to a computer, keep the length of one movie shorter than approx. 12 min. in 320 x 240 or 35 min. in 160 x 120.

Recording from a Tape in the Camcorder

CAMERA · | **PLAY · TAPE** | CAMERA · CARD | PLAY · CARD

1. **Play back the tape.**
2. **Press the start/stop button when the scene you wish to record appears.**
3. **Press the start/stop button to stop recording.**

MV960/MV940 Recording from Other Video Devices

You can record as movies on the memory card scenes captured from external video devices connected through the DV terminal. MV960 only: you can also use the analog to digital conversion to input video through the AV terminal.

For connecting instructions, refer to pages 32 and 70.

CAMERA · | **PLAY ·** | CAMERA · | PLAY ·

1. Set the camcorder to PLAY · mode.

- If a cassette is loaded, make sure the tape is stopped.
- MV960 When recording via the AV terminal, make sure that "AV➡DV" is displayed on the screen. When recording via the DV terminal, make sure that "AV➡DV" is not displayed. Change the setting as necessary (📖 76).

2. Connected device: Load a recorded cassette and play back the tape.

3. Press the start/stop button when the scene you wish to record appears.

4. Press the start/stop button to stop recording.

When recording from a tape in the camcorder or other video devices:

- ❍ A movie recorded from an image in widescreen mode will be vertically compressed.
- ❍ The data code of the movie will reflect the date and time it has been recorded on the memory card.
- ❍ Recording stops at blank sections or recordings in different audio mode (12bit/16bit).

Screen Displays during Movie Recording



① Card Access Display

"▶" appears and "" moves to indicate that the camcorder is writing on the memory card.

② Movie recording time

Indicates the recording time of the movie.

③ Image Size

Indicates the movie size.

④ Remaining Card Capacity for Movies

Indicates the remaining time in hours and minutes. At less than 1 minute, the remaining time will be displayed in 10 second-steps, at less than 10 seconds in 1 second-steps.

- The indication varies depending on the recording condition. The actual remaining time may be longer or shorter than indicated.

Selecting the Focusing Point

You can change the AF (autofocus) frame selection mode. When the program selector is set to EASY, the focusing point will automatically be set to [ON: AiAF].

9 Point AiAF	Depending on the shooting conditions, one or more AF frames out of the 9 frames available are automatically selected and focused on.
Center point	Out of the 9 frames available, the center AF frame is selected to focus. This is convenient for making sure the focus is exactly where you want it.

CAMERA · PLAY · **CAMERA ·** PLAY ·

MENU (📖 36)

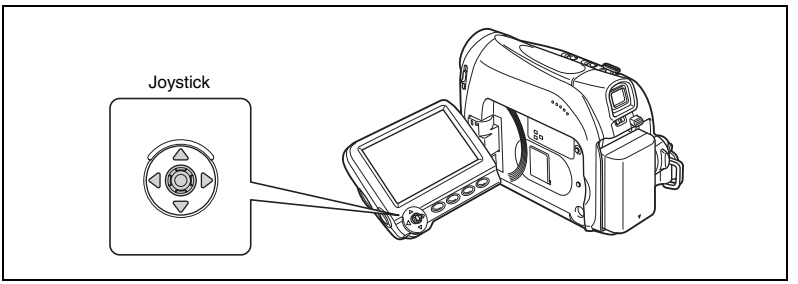


1. **Set the program selector to P.**
2. **Open the FUNC. menu, select (▲▼) the icon and press (●).**
3. **Select (▲▼) the [CAMERA SETUP] menu and press (●). Then, select (▲▼) the [FOCUS PRI.] option and press (●).**
4. **Select a setting option and press (●) to save the changes, then close the menu.**

 [OFF]: Turn off the focus priority mode when you wish to record a still image as soon as you press the PHOTO button. When set to [OFF], no focusing frame appears.

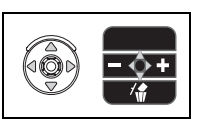
Playing Back a Memory Card

You can display a single image, 6 at one time (index screen 📖 93), or one after another (slide show 📖 93). Use the Card Jump function to quickly locate an image without displaying them one by one (📖 93).



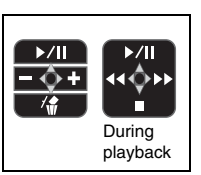
CAMERA · 📼 | PLAY · 📼 | CAMERA · 💾 | **PLAY · 💾**

1. **Set the camcorder to PLAY · 💾 mode.**
2. **If the joystick guide does not appear on screen, press (🕹) to display it.**
3. **Push the joystick (◀▶) to move between images.**



To play back a movie on the memory card:

4. **Push the joystick (▲) towards ▶/❚❚.**
 - Push the joystick (▲) towards ▶/❚❚ again to pause/resume the playback.
 - Push the joystick (▼) towards ■ to stop the playback.
 - When the movie playback ends or is stopped, the first frame of the movie appears as a still image.
 - Push the joystick (◀▶) towards ◀◀ or ▶▶ or press the REW ◀◀/FF ▶▶ button on the wireless controller for 8x fast forward/fast rewind playback.



- ❍ Images not recorded with this camcorder, uploaded from a computer (except the sample images 📖 57), edited on a computer and images whose file names have been changed may not be played back correctly.
- ❍ Do not turn off the camcorder, change the position of the TAPE/CARD switch, disconnect the power source, open the memory card cover or remove the memory card while the CARD access indicator is flashing. Doing so could result in data damage.

Slide Show

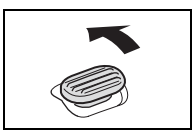
MENU
(36)



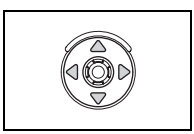
1. **Open the FUNC. menu and select (▲▼) the slide show icon.**
2. **Press (●) to start the slide show.**
 - Images and movies are played back one after another.
 - Press (●) again to stop the slide show.

Index Screen

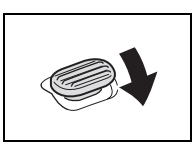
1. **Move the zoom lever toward W.**
 - Up to 6 images appear.
 - With movies, the index screen can only be started when the first scene is displayed as a still image.



2. **Use the joystick (▲▼, ◀▶) to move between the images.**
 Move the "☞" to the image you wish to view.

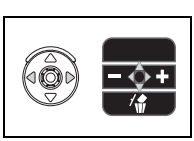


3. **Move the zoom lever toward T.**
 The index screen is cancelled and the selected image is displayed.



Card Jump Function

You can locate images without displaying them one by one. The number in the upper right of the screen indicates the image number of the current image out of the total number of images.



1. **If the joystick guide does not appear on screen, press (●) to display it.**
2. **Hold the joystick pushed towards (◀) or (▶) to run through the image numbers.**
 - When you release the button, the image corresponding to the displayed image number appears.
 - With movies, the card jump function can only be started when the first scene is displayed as a still image.

Protecting Images

You can protect important images from accidental erasure when displaying a single image or index screen.

If a memory card is initialized, all still images and movies, even protected ones, will be erased permanently.

Movies can only be protected when the first scene is displayed as a still image.

CAMERA · PLAY · **CAMERA · PLAY ·**

MENU (📖 36) → PROTECT OFF

1. **Select the image you wish to protect.**
2. **Open the FUNC. menu and select (▲▼) the image protection icon.**
 In **CAMERA ·** mode: The image protect menu appears only when you press the FUNC. button while reviewing a still image immediately after recording it.
3. **Set (◀▶) it to [PROTECT ON], press (⊛) and close the menu.**
 - "🔑" appears and now the image cannot be erased.
 - To cancel the protection, repeat the operation and select [PROTECT OFF].

Protecting in Index Screen Display

CAMERA · PLAY · CAMERA · **PLAY ·**

MENU (📖 36) → CARD OPERATIONS → ➡ PROTECT

1. **Move the zoom lever toward W.**
 - Up to 6 images appear.
 - Select the image you wish to protect.
2. **Open the setup menus, select the [CARD OPERATIONS] menu and press (⊛).**
 Pressing the FUNC. button from the index screen will open the menu directly in the setup menus screen.
3. **Select (▲▼) the [➡ PROTECT] option and press (⊛).**
4. **Select (▲▼, ◀▶) the image you want to protect and press (⊛).**
 - "🔑" appears on the image.
 - To cancel the protection, (⊛) again.
5. **Close the menu.**

Erasing Images

You can erase images one at a time or all at once.

Be careful when erasing images. Erased images cannot be recovered.

- Protected images cannot be erased.
- Movies can only be erased when the first scene is displayed as a still image.

Erasing a Single Image

CAMERA · 📼 | PLAY · 📼 | **CAMERA · 💾** | **PLAY · 💾**

1. **If the joystick guide does not appear on screen, press (⊕) to display it.**
2. **Use the joystick to select (◀▶) the image you want to erase.**
3. **Push the joystick (▼) towards 🗑 to erase the image.**
 In **CAMERA · 💾** mode: The image erase menu appears only when you press the FUNC. button while reviewing a still image immediately after recording it.
4. **Select (◀▶) [ERASE] and press (⊕) to erase the image and close the menu.**

Erasing All Images

CAMERA · 📼 | PLAY · 📼 | CAMERA · 💾 | **PLAY · 💾**

MENU (📖 36)



1. **Open the FUNC. menu, select (▲▼) the 🎞 icon and press (⊕).**
2. **Select (▲▼) the [CARD OPERATIONS] menu and press (⊕). Then, select (▲▼) the [ERASE ALL IMAGES] option and press (⊕).**
3. **Select (▲▼) [YES] and press (⊕) to erase the images, then close the menu.**
 All still images or movies with exception of the protected ones are erased.

Initializing a Memory Card

Initialize new memory cards, or when you get the message “CARD ERROR”. You can also initialize a memory card to erase all data recorded on it.

- ❍ Initializing a memory card erases all data, including protected images.
- ❍ Images erased by initializing cannot be recovered.
- ❍ Initialize all memory cards before using them with this camcorder.

CAMERA · PLAY · CAMERA · **PLAY ·**

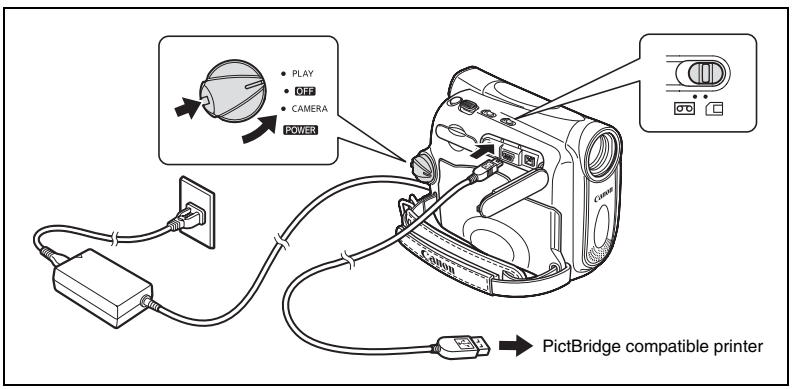
MENU (📖 36) → CARD OPERATIONS → INITIALIZE

1. **Open the FUNC. menu, select (▲▼) the icon and press (●).**
2. **Select (▲▼) the [CARD OPERATIONS] menu and press (●). Then, select (▲▼) the [INITIALIZE] option and press (●).**
3. **Select (▲▼) [YES] and press (●).**
4. **In the confirmation screen, select (▲▼) [YES] to initialize the memory card.**
 - The card initialization will take a moment. When the card initialization is completed the camcorder will return to the [CARD OPERATIONS] menu.
 - Select [NO] to go back to step 3.
5. **Close the menu.**

PictBridge

The camcorder can be connected to any PictBridge compatible printer. You can use the print order settings for direct printing of still images recorded on the memory card (📖 101).
Canon printers: SELPHY CP, SELPHY DS and PIXMA printers

Connecting the Printer to the Camcorder



CAMERA · 📼 | PLAY · 📼 | CAMERA · 💾 | **PLAY · 💾**

1. **Turn off the camcorder and insert a memory card that contains still images.**
2. **Turn on the printer.**
3. **Set the camcorder to PLAY · 💾 mode.**
4. **Connect the camcorder to the printer using the USB cable.**
 "🔌" appears and changes to "PictBridge" when the printer is properly connected to the camcorder. (Does not appear with movies, or still images that cannot be played back with the camcorder.)

If "🔌" continues to flash (for more than 1 minute) or if "PictBridge" does not appear, the camcorder is not correctly connected to the printer. In such case, disconnect the cable from camcorder and printer, turn off camcorder and printer, turn both back on and reconnect the camcorder to the printer.

- ❍ Refer also to the printer's instruction manual.
- ❍ We recommend powering the camcorder from a household power source.
- ❍ The print setting menu may differ slightly depending on the connected printer.

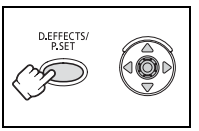
Printing after Selecting the Print Settings

You can select the number of copies and other settings for printing. The setting options vary depending on your printer model.

CAMERA · | PLAY · | CAMERA · | **PLAY ·**

1. Press the P.SET button.

- The print setting menu appears.
- Depending on the printer, the message “BUSY.” may appear before the camcorder displays the print setting menu.



2. Select the print settings (📖 99).

3. Select (▲▼, ◀▶) the [PRINT] option and press (⊛).

- Printing starts. The print setting menu disappears when printing is complete.
- To continue printing, select (◀▶) another still image.

❍ Observe the following precautions during printing, otherwise printing may not be performed correctly.
- Do not turn off the camcorder or the printer.
- Do not change the position of the TAPE/CARD switch.
- Do not detach the cable.
- Do not open the memory card cover or remove the memory card.

❍ Images not recorded with this camcorder, uploaded from a computer, edited on a computer and images whose file names have been changed may not be printed correctly.

❍ If the message “BUSY.” does not disappear, disconnect the cable from camcorder and printer and reconnect the camcorder to the printer.

❍ **Cancel Printing**
Press (⊛) during printing. A confirmation dialog appears. Select [OK] and press (⊛). With Canon’s PictBridge compatible printers, the printing will stop immediately (even if not completed) and the paper will be fed through.

❍ **Printing Errors**
If an error occurs during the printing process, an error message appears (📖 112).
- Canon’s PictBridge compatible printers: Resolve the error. When printing does not resume automatically, select [CONTINUE] and press (⊛). If [CONTINUE] cannot be selected, select [STOP], press (⊛) and retry printing. Refer also to the printer manual for details.
- If the error still persists and printing does not restart:
 1. Disconnect the USB cable.
 2. Turn the POWER switch of the camcorder to OFF and back to PLAY.
 3. Reconnect the cable.

❍ **When you have finished printing:**
1. Disconnect the cable from the camcorder and printer.
2. Turn off the camcorder.

Selecting the Number of Copies

A maximum of 99 copies can be selected for one still image.

1. **In the print setting menu, select (▲▼, ◀▶) the (number of copies) icon and press ().**
2. **Select the (▲▼) number of copies and press ().**



Setting the Print Style

PAPER	PAPER SIZE	Available paper sizes vary depending on the printer model.
	PAPER TYPE	PHOTO, FAST PHOTO, DEFAULT
	PAGE LAYOUT	BORDERLESS, BORDERED, DEFAULT, 8-UP
(date print)		ON, OFF, DEFAULT
(print effect)		ON, OFF, VIVID, NR, VIVID+NR, DEFAULT

- The settings in the table are given as an indication. Available setting options will differ depending on the printer model.
- Print setting options and [DEFAULT] settings vary depending on the printer model. For details, refer to the instruction manual of your printer.
- [BORDERED]: The image area remains relatively unchanged from the recorded image when it is printed. [BORDERLESS]: The center portion of the recorded image is printed at an enlarged size. The image's top, bottom and sides may be cropped slightly.
- [VIVID], [VIVID+NR] and [NR] can be selected with Canon PIXMA/SELPHY DS Printers.
- **Canon printers:**
 - The [PAGE LAYOUT] setting depends on the paper size selected. When [PAPER SIZE] is set to [10 x 14.8 cm], select as the layout 2-, 4-, 9- or [16-UP]; when [PAPER SIZE] is set to [A4], select as the layout [4-UP]. Canon PIXMA/SELPHY DS printers: you can also print on the specially designed Photo Stickers sheets.
 - When selecting [8-UP], set the [PAPER SIZE] to [CREDITCARD]. Canon SELPHY CP printers: you can also print on the specially designed Photo Stickers sheets.

Paper Settings



1. **In the print setting menu, select (▲▼, ◀▶) the [PAPER] option and press (●).**
2. **Select (▲▼) the paper size and press (●).**
 Select the paper size of the paper set in your printer.
3. **Select (▲▼) the paper type and press (●).**
 Select the paper type of the paper set in your printer.
4. **Select (▲▼) a layout option and press (●).**

Including the Date in the Print



1. **In the print setting menu, select (▲▼, ◀▶) the ⏲ (date) icon and press (●).**
2. **Select (▲▼) a date print option and press (●).**

Setting the Print Effect (Image Optimize)

This function uses the camcorder's recording information to optimize the image data, yielding high quality prints.



1. **In the print setting menu, select (▲▼, ◀▶) the 🖼 (print effect) icon and press (●).**
2. **Select (▲▼) a setting and press (●).**

Printing with Print Order Settings

You can select still images for printing and set the number of copies. These print order settings are compatible with the Digital Print Order Format (DPOF) standards and can be used for printing on DPOF compatible printers (97). A maximum of 998 still images can be selected.

Selecting Still Images for Printing (Print Order)

Do not connect a USB or DV cable to the camcorder while setting the print orders.

CAMERA · | PLAY · | CAMERA · | **PLAY ·**

MENU (36) → PRINT ORDER

1. **Select the still image you wish to print.**
2. **Open the FUNC. menu and select (▲▼) the print order icon.**
3. **Set (◀▶) the number of copies, press (●) and close the menu.**
 To cancel the print order, set the number of copies to 0.

Selecting in Index Screen Display

CAMERA · | PLAY · | CAMERA · | **PLAY ·**

MENU (36) → CARD OPERATIONS → ➡ PRINT ORDER

1. **Move the zoom lever toward** W**.**
 - Up to 6 images appear.
 - Select the image you wish to print.
2. **Open the setup menus, select the [CARD OPERATIONS] menu and press (●).**
 Pressing the FUNC. button from the index screen will open the menu directly in the setup menus screen.
3. **Select (▲▼) the [➡ PRINT ORDER] option and press (●).**
4. **Select (▲▼, ◀▶) the image you want to print and press (●).**
 - "🖨" appears on the image.
 - To cancel the print order, set the number of copies to 0.
5. **Close the menu.**

Erasing All Print Orders

CAMERA · | PLAY · | CAMERA · | **PLAY ·**

MENU (📖 36) → CARD OPERATIONS → PRINT ORD. ALL ERASE

1. **Open the FUNC. menu, select (▲▼) the icon and press (●).**
2. **Select (▲▼) the [CARD OPERATIONS] menu and press (●). Then, select (▲▼) the [PRINT ORD.ALL ERASE] option and press (●).**
3. **Select (▲▼) [YES] and press (●) to erase all the print orders, then close the menu.**
 All "🖶" disappear.

Printing

CAMERA · | PLAY · | CAMERA · | **PLAY ·**

MENU (📖 36) → ➡ 🖶 PRINT

1. **Connect the printer to the camcorder (📖 97).**
2. **Open the FUNC. menu, select (▲▼) the icon and press (●).**
3. **Select (▲▼) the [➡ 🖶 PRINT] menu and press (●).**
 - The print setting menu appears.
 - "SET 🖶 PRINT ORDER" appears, when you connect a printer with direct print function and select [➡ 🖶PRINT] without having set the print order.
4. **Make sure that [PRINT] is selected and press (●).**
 Printing starts. The print setting menu disappears when printing is complete.

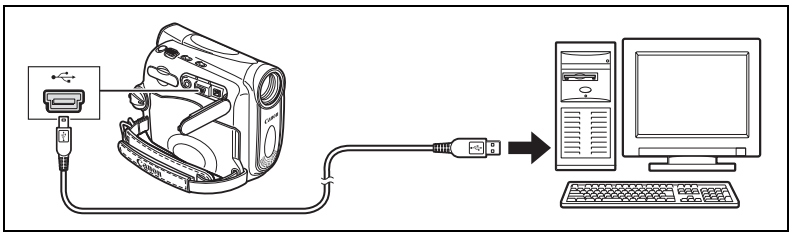
❍ Depending on the connected printer, you can select style or paper settings before step 4.

❍ **Cancel Printing/Printing Errors (📖 98)**

❍ **Restarting Printing**
In PLAY · mode open the FUNC. menu, select and press (●), then select the [➡ 🖶PRINT] menu and press (●). Select [RESUME] in the print setting menu and press (●). The remaining images will be printed.
Printing cannot be restarted in the following cases:
- When you change the print order settings.
- When you delete a still image with print order settings.

Transferring Memory Card Images to a Computer

With the supplied USB cable and Digital Video Software, you can browse and archive images or arrange still images for printout. For details, refer to the *Digital Video Software* instruction manual (PDF file).



- ❍ Do not disconnect the USB cable, open the memory card cover, remove the memory card, change the position of the TAPE/CARD switch or turn off the camcorder and computer while data is being transferred to the computer (while the camcorder's CARD access indicator is flashing). Doing so may damage the memory card's data.
- ❍ Operation may not work correctly depending on the software and the specifications/settings of your computer.
- ❍ The image files on your memory card and the image files saved on the hard disk drive of your computer are valuable, original data files. If you wish to use image files on your computer, make copies of them first, and use the copied file, retaining the original.
- ❍ Make sure that camcorder and computer are not connected with a DV cable before connecting the camcorder to the computer using the USB cable. Otherwise, the computer may not operate properly.

- ❍ We recommend powering the camcorder from a household power source while it is connected to the computer.
- ❍ Refer also to the computer instruction manual.
- ❍ Users of Windows XP and Mac OS X:
 Your camcorder is equipped with the standard Picture Transfer Protocol (PTP) allowing you to download still images (JPEG only) by simply connecting the camcorder to a computer via USB cable without installing the software from the DIGITAL VIDEO SOLUTION DISK.

Direct Transfer

You can transfer images to a computer by operating the camcorder.

ALL IMAGES...	Transfers all images to the computer.
NEW IMAGES...	Transfers only those images that have not yet been transferred to the computer.
TRANSFER ORDERS...	Transfers images with transfer orders to the computer.
SELECT & TRANSFER...	Allows you to select an image and transfers the selected image to the computer.
WALLPAPER...	Allows you to select a still image and transfers the selected image to the computer as wallpaper.

Preparations

The first time you connect the camcorder to the computer, you need to install the software and set the auto-launch setting.

CAMERA · | PLAY · | CAMERA · | **PLAY ·**

1. **Install the supplied Digital Video Software.**
 See *Installing the Software* in the *Digital Video Software* instruction manual (PDF file).
2. **Set the camcorder to PLAY · mode.**
3. **Connect the camcorder to the computer using the USB cable.**
 See *Connecting the Camcorder to a Computer* in the *Digital Video Software* instruction manual (PDF file).
4. **Set the auto-launch setting.**
 - See *Starting CameraWindow* in the *Digital Video Software* instruction manual (PDF file).
 - The direct transfer menu appears on the camcorder screen.

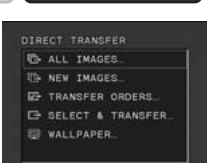
From the second time on, you only need to connect the camcorder to the computer to transfer images.

Transferring All Images, New Images or Images with Transfer Orders

To transfer images with transfer order, you need to set the transfer orders (📖 106).

CAMERA · | PLAY · | CAMERA · | **PLAY ·**

1. **Select (▲▼) [ALL IMAGES], [NEW IMAGES] or [TRANSFER ORDERS] and press ().**
 A confirmation message appears.



2. Select (◀▶) [OK] and press ().

- The images are transferred to the computer and displayed in the Main Window of ZoomBrowser EX.
- The camcorder displays the transfer menu when transfer is complete.
- To cancel transfer, select (◀▶) [CANCEL] and press (), or press the FUNC. button.

Transferring a Selected Image

CAMERA · | PLAY · | CAMERA · | **PLAY ·**

1. Select (▲▼) [SELECT & TRANSFER] and press ().



2. Select (◀▶) the image you wish to transfer and press ().

- The selected image is transferred to the computer and displayed in the Main Window of ZoomBrowser EX or ImageBrowser EX.
- To continue transferring, select (◀▶) another image.
- Pressing the FUNC. button brings you back to the transfer menu.

Transferring a Still Image as Wallpaper

CAMERA · | PLAY · | CAMERA · | **PLAY ·**

1. Select (▲▼) [WALLPAPER] and press ().



2. Select (◀▶) the still image you wish to transfer as wallpaper and press ().

- The selected image is transferred to the computer and displayed on the desktop.
- Pressing the FUNC. button brings you back to the transfer menu.

When the protect switch of the SD Memory Card is activated during image transfer, the images will not be marked as “already transferred”, and will be transferred again when you select [NEW IMAGES] later.

Selecting Images for Transfer (Transfer Order)

You can select images for transfer to the computer. These transfer settings are compatible with the Digital Print Order Format (DPOF) standards. A maximum of 998 images can be selected.

Do not connect a USB or DV cable to the camcorder while setting the transfer orders.

CAMERA · | PLAY · | CAMERA · | **PLAY ·**

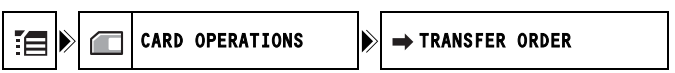
MENU (📖 36)



1. **Select the image you wish to transfer.**
2. **Open the FUNC. menu and select (▲▼) the transfer order icon.**
3. **Set (◀▶) it to [TRANS.ORDER ON], press (⊛) and close the menu.**
 To cancel the transfer order, set it to [TRANS.ORDER OFF] again.

Selecting in Index Screen Display

MENU (📖 36)



1. **Move the zoom lever toward** W.
 Up to 6 images appear.
2. **Open the setup menus, select the [CARD OPERATIONS] menu and press (⊛).**
 Pressing the FUNC. button from the index screen will open the menu directly in the setup menus screen.
3. **Select (▲▼) the [➡ TRANSFER ORDER] option and press (⊛).**
4. **Select (▲▼, ◀▶) the image you want to transfer and press (⊛).**
 - "⊟" appears on the image.
 - To cancel the transfer order, press (⊛) again.
5. **Close the menu.**

Erasing All Transfer Orders

MENU (📖 36)



1. **Open the FUNC. menu, select (▲▼) the icon and press (⊛).**
2. **Select (▲▼) the [CARD OPERATIONS] menu and press (⊛). Then, select (▲▼) the [TRANS.ORD.ALL ERASE] option and press (⊛).**
3. **Select (▲▼) [YES] and press (⊛) to erase all the transfer orders, then close the menu.**
 All "⊟" disappear.

Hiding the Displays on the LCD Screen

You can hide the displays on the LCD screen to have a clear screen for playback.

CAMERA · | PLAY · | CAMERA · | PLAY ·

MENU (📖 36)



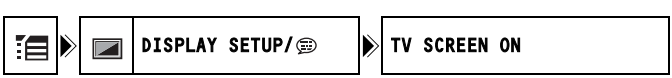
1. **Open the FUNC. menu, select (▲▼) the icon and press ().**
2. **Select (▲▼) the [DISPLAY SETUP/] menu and press (). Then, select (▲▼) the [DISPLAYS] option and press ().**
3. **Set it to [OFF <PLAYBK>] and press () to save the changes, then close the menu.**
 - Warning messages still appear, and the data code appears if turned on.
 - The displays appear while a playback image is magnified or a digital effect is activated.
 - Tape operation displays appear for 2 seconds.
 - Displays cannot be hidden on the index screen.

Hiding/Showing the Displays on the TV Screen

When you connect a TV for recording, you can select to hide the camcorder displays on the TV screen. For playback, you can show the camcorder displays on the TV screen.

CAMERA · | PLAY · | CAMERA · | PLAY ·

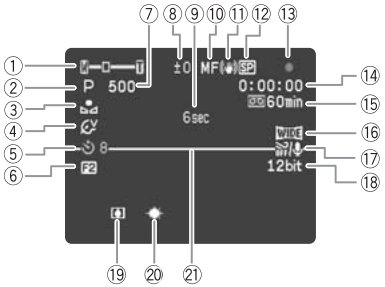
MENU (📖 36)



1. **Open the FUNC. menu, select (▲▼) the icon and press ().**
2. **Select (▲▼) the [DISPLAY SETUP/] menu and press (). Then, select (▲▼) the [TV SCREEN] option and press ().**
3. **Set it to [ON] or [OFF] and press () to save the changes, then close the menu.**

Screen Displays during Recording/Playback

CAMERA · 📼 (see also 🕮 24)



① Operating mode (🕮 4), Zoom (🕮 25), Exposure adjustment (🕮 46)
② Recording program (🕮 41)
③ White balance (🕮 48)
④ Image effects (🕮 49)
⑤ Self-timer (🕮 53)
⑥ Digital effects (🕮 56)
⑦ Shutter speed (🕮50)
⑧ Exposure lock (🕮 45)
⑨ Recording reminder (🕮 24)
⑩ Manual focus (🕮 46)
⑪ Image stabilizer (🕮 68)
⑫ Recording mode (🕮 54)
⑬ Tape operation
⑭ Time code (🕮 24)
⑮ Remaining tape (🕮 24)
⑯ Widescreen mode (🕮 60)
⑰ Wind screen (🕮 55)
⑱ Audio mode (🕮 55)
⑲ Condensation warning (🕮 114)
⑳ **MV960** White LED light (assist lamp) (🕮 52)
㉑ Level marker (🕮 22)

PLAY · 📼



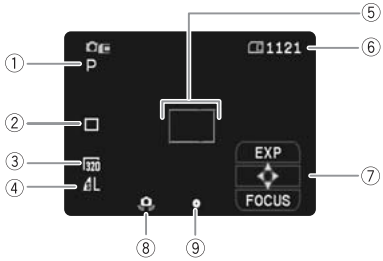
① 12 bit audio (🕮 79)
② End search (🕮 63) / Date search (🕮 65) / Audio dubbing (🕮 77)
③ Tape operation
④ Joystick guide (🕮 3)
⑤ Data code (🕮 62)

③
- ●: Recording
- ●II: Record pause
- ■: Stop
- ⏏: Eject
- ▶: Playback
- ▶▶: Fast forward
- ◀◀: Rewind

▶▶/◀◀: Fast forward playback/ Rewind playback (🕮 30)
x2▶/◀x2: x2 playback (🕮 30)
x1▶/◀x1: x1 playback (🕮 30)
I▶/◀I: Slow playback (🕮 30)
II▶/◀II: Frame advance playback/ frame reverse playback (🕮 30)

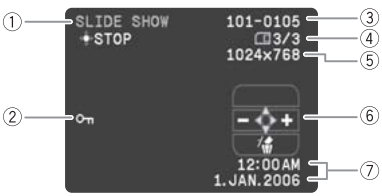
▶II/II◀: Playback pause (🕮 30)
▶▶I/I◀◀: Date search (🕮 65)
▶▶/◀◀: Zero set memory (🕮 64)
⏷/⏷II: Audio dubbing (🕮 77)

CAMERA · (see also 90)



① Recording program (41)
② Single still image icon
③ Movie size (89)
④ Still image size/quality (82)
⑤ Focusing frame (91)
⑥ Remaining card capacity for still images (88)
⑦ Joystick guide (3)
⑧ Camcorder shake warning (51)
⑨ AF/AE locked (91)

PLAY ·



① Slide show (93)
② Protect mark (94)
③ File number (84)
④ Current image/Total number of images
⑤ Still image size (84)
⑥ Joystick guide (3)
⑦ Data code (62)

List of Messages

Message	Explanation	🕮
SET THE TIME ZONE, DATE AND TIME	You have not set the time zone, date and time. This message appears each time you turn the power on until you set the time zone, date and time.	19
CHANGE THE BATTERY PACK	Battery pack is exhausted. Replace or charge the battery pack.	12
THE TAPE IS SET FOR ERASURE PREVENTION	Cassette is protected. Replace the cassette or change the position of the protect switch.	117
REMOVE THE CASSETTE	Camcorder stopped operating to protect the tape. Unload and reload the cassette.	15
CHECK THE INPUT	DV cable is not connected, or the connected digital device is turned off.	73
CONDENSATION HAS BEEN DETECTED	Condensation has been detected in the camcorder.	114
CONDENSATION HAS BEEN DETECTED REMOVE THE CASSETTE	Condensation has been detected in the camcorder. Unload the cassette.	114
TAPE END	Tape reached the end. Rewind the tape or replace the cassette.	–
CHECK THE CASSETTE [REC MODE]	You attempted to perform audio dubbing on a tape recorded in a mode other than the SP mode.	77
CHECK THE CASSETTE [AUDIO MODE]	You attempted to perform audio dubbing on a tape recorded in 16-bit or 12-bit 4-channel sound.	77
CHECK THE CASSETTE [BLANK]	You attempted to perform audio dubbing on a tape with a blank section.	77
CHECK THE CASSETTE [INCORRECT TAPE SPECIFICATION]	You attempted to perform audio dubbing on a tape recorded in HD standard.	–
INCORRECT TAPE SPECIFICATION PLAYBACK IS RESTRICTED	You attempted to play back a tape recorded in HD standard.	–
INPUT SIGNAL NOT SUPPORTED	You attempted to input video signal in HD standard through the DV terminal.	73
HEADS DIRTY, USE CLEANING CASSETTE	Video heads are dirty. Clean the video heads.	114
COPYRIGHT PROTECTED PLAYBACK IS RESTRICTED	You attempted to play back a copyright protected tape.	74
COPYRIGHT PROTECTED DUBBING RESTRICTED	You attempted to dub a copyright protected tape. May also appear when an anomalous signal is received during analog line-in recording, or during analog-digital conversion of a copyright protected tape.	74

Memory Card Related Messages

Message	Explanation	📖
NO CARD	Memory card not is inserted into the camcorder.	81
THE CARD IS SET FOR ERASURE PREVENTION	SD Memory Card is set for erasure prevention. Replace the card or change the position of the protect switch.	81
NO IMAGES	No images are recorded on the memory card.	–
CARD ERROR	A memory card error occurred. The camcorder cannot record or play back the image. The error may be temporary. If the message disappears after 4 seconds and "⊡" flashes red, turn the camcorder off, remove the card and reinsert the card. If "⊡" changes to green, you can continue recording/playback.	–
CARD FULL	No remaining capacity on the memory card. Replace with another card or erase images.	–
NAMING ERROR	File or folder number has reached the maximum value.	84
UNIDENTIFIABLE IMAGE	Image is not recorded with JPEG compression, or with a compression not compatible with the camcorder, or the image file is corrupted.	–
TRANSFER ORDER ERROR	You attempted to set more than 998 transfer orders.	106
CANNOT TRANSFER!	You attempted to transfer a movie file as wallpaper.	105
THIS IMAGE CANNOT BE RECORDED	Some analog images cannot be recorded on the memory card depending on the signal.	–
TOO MANY STILL IMAGES DISCONNECT USB CABLE	Disconnect the USB cable and decrease the number of still images on the memory card to less than 1800. If a dialog appeared on the computer screen, close it. Reconnect the USB cable.	–

Direct Print Related Messages

Following messages may appear on the camcorder screen. On printers equipped with an operation panel, an error number or message displays on the panel. Refer to the printer's manual for the remedies corresponding to the error numbers or messages.

Message	Explanation
PAPER ERROR	There is a problem with the paper. The paper is not correctly inserted, the wrong paper size is inserted, or the ink cannot be used with the selected paper.
NO PAPER	There is no paper.
PAPER JAM	The paper jammed during printing.
INK ERROR	Refer to the printer's manual to solve the problem.
NO INK	The ink cartridge is not inserted or is out of ink. Refer to the printer's manual to solve the problem.
LOW INK LEVEL	The ink cartridge needs to be replaced soon.
WASTE TANK FULL	Waste tank is full. Refer to the instruction manual of your printer.
FILE ERROR	You attempted to print an image that was recorded with another camcorder, with a different compression, or was edited on a computer.
CANNOT PRINT!	You attempted to print an image that was recorded with another camcorder, with a different compression, or was edited on a computer.
COULD NOT PRINT X IMAGES	You attempted to use the print order settings to print X images that were recorded with another camcorder, with a different compression or were edited on a computer.
SET PRINT ORDER	You attempted to print an image from the PLAY menu [PRINT] without having set the print order.
PRINT ORDER ERROR	You attempted to set more than 998 still images in the print order.
PRINTER ERROR	Cancel printing. Turn off the printer and turn it back on. Check the printer status.
PRINT ERROR	Cancel printing, disconnect the USB cable and turn off the printer. After a while, turn the printer back on and reconnect the USB cable. Check the printer status.
HARDWARE ERROR	Refer to the printer's manual to solve the problem.
COMMUNICATION ERROR	The printer is experiencing a data transmission error. Cancel printing, disconnect the USB cable and turn off the printer. After a while, turn the printer back on and reconnect the USB cable. Or, you attempted to print from a memory card that contains a large number of images. Reduce the number of images.
PRINTER IN USE	The printer is in use. Check the printer status.
PAPER LEVER ERROR	Paper lever error occurred. Adjust the paper selection lever to the proper position.
PRINTER COVER OPEN	Close the printer cover securely.
NO PRINTHEAD	No print head is installed in the printer or print head is defect. Refer to the instruction manual of your printer.

Camcorder Handling Precautions

- ❍ Do not carry the camcorder by the LCD panel.
- ❍ Do not leave the camcorder in places subject to high temperatures, such as a sun-heated car, and high humidity.
- ❍ Do not use the camcorder near strong electric or magnetic fields such as above TVs, near plasma TVs or mobile phones.
- ❍ Do not point the lens or viewfinder at strong light sources. Do not leave the camcorder pointed at a bright subject.
- ❍ Do not use the camcorder in dusty or sandy places. Dust or sand getting inside the cassette or camcorder may cause damage. Dust and sand can also damage the lens. Attach the lens cap after use.
- ❍ The camcorder is not waterproof. Water, mud or salt getting inside the cassette or camcorder may cause damage.
- ❍ Be careful of heat generated by lighting equipment.
- ❍ Do not disassemble the camcorder. If the camcorder does not function properly, consult qualified service personnel.
- ❍ Handle the camcorder with care. Do not subject the camcorder to shocks or vibration as this may cause damage.
- ❍ Avoid sudden changes in temperature. Moving the camcorder rapidly between hot and cold temperatures may cause condensation to form on its internal surfaces (🕮 114).

Storage

- ❍ If you do not intend to use the camcorder for a long time, store it in a place free of dust, in low humidity, and at temperatures not higher than 30 °C.
- ❍ After storage, check the functions of your camcorder to make sure that the camcorder is still working properly.

Cleaning

Camcorder Body and Lens

- ❍ Use a soft, dry cloth to clean the camcorder body and lens. Never use chemically treated cloth or volatile solvents such as paint thinner.

LCD Screen

- ❍ Clean the LCD screen using a commercially available cleaning cloth for glasses.
- ❍ Condensation may form on the surface of the screen when the temperature changes suddenly. Wipe it with a soft dry cloth.
- ❍ At cold temperatures, the screen may be darker than usual. This is not a malfunction. The screen returns to normal when the camcorder warms up.

Viewfinder

❍ Clean the viewfinder screen using a blower brush or a commercially available cleaning cloth for glasses.

Video Heads

❍ When the playback picture becomes distorted, the video heads need to be cleaned.
❍ To maintain the best picture quality, we recommend cleaning the video heads frequently with the Canon DVM-CL Digital Video Head Cleaning Cassette or a commercially available dry cleaning cassette.
❍ Tapes already recorded with dirty video heads may not be played back correctly even when you clean the video heads.
❍ Do not use wet type cleaning cassettes as this may damage the camcorder.



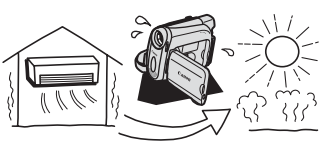


Condensation

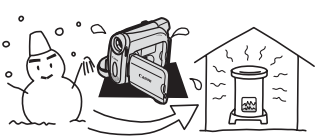
Moving the camcorder rapidly between hot and cold temperature may cause condensation (water droplets) to form on its internal surfaces. Stop using the camcorder if condensation is detected. Continued use may damage the camcorder.

Condensation may form in the following cases:

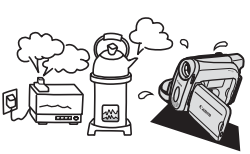
When the camcorder is moved from an air-conditioned room to warm, humid place



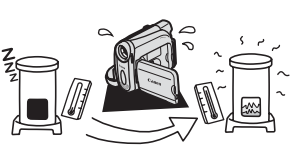
When the camcorder is moved from a cold place to a warm room



When the camcorder is left in a humid room



When a cold room is heated rapidly



How to avoid condensation:

❍ Unload the cassette, place the camcorder in an airtight plastic bag and let it adjust to temperature changes slowly before removing it from the bag.

When condensation is detected:

❍ The camcorder stops operating and the warning message “CONDENSATION HAS BEEN DETECTED” appears for approx. 4 seconds and “” starts flashing.

❍ If a cassette is loaded, the warning message “REMOVE THE CASSETTE” appears and “” starts flashing. Remove the cassette immediately and leave the cassette compartment open. Leaving the cassette in the camcorder may damage the tape.

❍ A cassette cannot be loaded when condensation is detected.

Resuming use:

❍ It takes about 1 hour until the water droplets evaporate. After the condensation warning stops flashing, wait for 1 more hour before resuming use.

Battery Pack Handling Precautions

DANGER!
Treat the battery pack with care.

- Keep it away from fire (or it might explode).
- Do not expose the battery pack to temperatures higher than 60 °C. Do not leave it near a heater or inside a car in hot weather.
- Do not try to disassemble or modify it.
- Do not drop or knock it.
- Do not get it wet.

❍ Charged battery packs continue to discharge naturally. Therefore, charge them on the day of use, or the day before, to ensure a full charge.

❍ Attach the terminal cover whenever a battery pack is not in use. Contact with metallic objects may cause a short circuit and damage the battery pack.

❍ Dirty terminals may cause a poor contact between the battery pack and the camcorder. Wipe the terminals with a soft cloth.

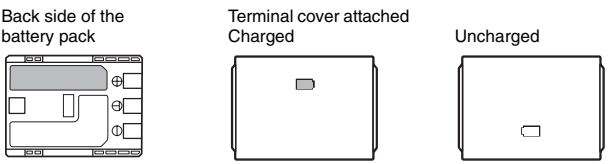
❍ Since storing a charged battery pack for a long time (about 1 year) can shorten its lifecycle or affect performance, we recommend to discharge the battery pack fully and to store it in a dry place at temperatures no higher than 30 °C. If you do not use the battery pack for long periods, charge and discharge it fully at least once a year. If you have more than 1 battery pack, perform these precautions at the same time for all battery packs.

❍ Although the battery pack’s operating temperature range is from 0 °C to 40 °C, the optimal range is from 10 °C to 30 °C. At cold temperatures, performance will temporarily decline. Warm it in your pocket before use.

❍ Replace the battery pack if the usable time after full charge diminishes substantially at normal temperatures.

About the battery terminal cover

The battery terminal cover has a []-shaped hole. This is useful when you wish to differentiate between charged and uncharged battery packs. For example, with charged battery packs, attach the terminal cover so that the []-shaped hole shows the blue label.



Lithium Button Battery Handling Precautions

WARNING!

- The battery used in this device may present a fire or chemical burn hazard if mishandled. Do not recharge, disassemble, heat above 100 °C or incinerate the battery.

CR1616:

- Replace the battery with a CR1616 made by Panasonic, Hitachi Maxell, Sony, Toshiba, Varta or Renata. Use of other batteries may present a risk of fire or explosion.

CR2025:

- Replace the battery with a CR2025 made by Panasonic, Hitachi Maxell, Sony, Sanyo, or with Duracell2025. Use of other batteries may present a risk of fire or explosion.
- The used battery should be returned to the supplier for safe disposal.

❍ Do not pick up the battery using tweezers or other metal tools as this will cause a short circuit.
❍ Wipe the battery with a clean dry cloth to ensure proper contact.
❍ Keep the battery out of reach of children. If it is swallowed, seek medical assistance immediately. The battery case may break and the battery fluids may damage stomach and intestines.
❍ Do not disassemble, heat or immerse the battery in water to avoid the risk of explosion.

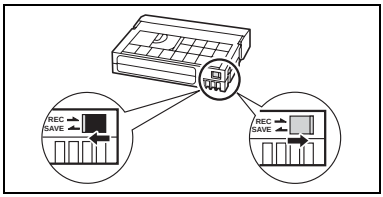
Cassette Handling Precautions

❍ Rewind tapes after use. If the tape becomes slack and damaged, it may cause picture and sound distortion.
❍ Return cassettes in the case and store them upright.
❍ Do not leave the cassette in the camcorder after use.
❍ Do not use spliced tapes or nonstandard cassettes as they may damage the camcorder.
❍ Do not use tapes that have been jammed as video heads may become dirty.
❍ Do not insert anything into the small holes of the cassette, or cover them with cellophane tape.
❍ Handle cassettes with care. Do not drop or subject them to severe impact as this may damage the cassettes.

❍ Rewind tapes from time to time if they are stored for a long time.
❍ With cassettes equipped with a memory function, metal plated terminals may become dirty with use. Clean the terminals with a cotton swab after about 10 times of loading/unloading. The memory function is not supported by the camcorder.

Protecting Tapes from Accidental Erasure

To protect your recordings from accidental erasure, slide the tab on the cassette to the left. (This switch position is usually labeled SAVE or ERASE OFF.)



If you load a protected cassette in CAMERA mode, the message “THE TAPE IS SET FOR ERASURE PREVENTION” appears for approx. 4 seconds and “” starts flashing. If you wish to record on that cassette, slide the tab back to the right.

Memory Card Handling Precautions

❍ Initialize new memory cards with the camcorder. Memory cards initialized with other devices such as a computer may not operate correctly.
❍ We recommend saving backups of memory card images on your computer’s hard drive or other external memory device. Image data may be corrupted or lost due to memory card defects or exposure to static electricity. Canon Inc. makes no warranties for corrupted or lost data.
❍ Do not turn off the camcorder, disconnect the power source, open the memory card cover or remove the memory card while the CARD access indicator is flashing.
❍ Do not use memory cards in places subject to strong magnetic fields.
❍ Do not leave memory cards in places subject to high humidity and high temperature.
❍ Do not disassemble memory cards.
❍ Do not bend, drop, or subject memory cards to shocks and do not expose them to water.
❍ Moving a memory card rapidly between hot and cold temperatures may cause condensation to form on its external and internal surfaces. If condensation forms on the card, put it aside until the droplets have evaporated completely.
❍ Do not touch or expose the terminals to dust or dirt.
❍ Check the direction before inserting the memory card. Forcing a memory card backwards into the slot may damage the memory card or the camcorder.
❍ Do not remove the label from the memory card, or affix other labels on the memory card.

Using the Camcorder Abroad

Power Sources

You can use the compact power adapter to operate the camcorder and to charge battery packs in any country with power supply between 100 and 240 V AC, 50/60 Hz. Consult the Canon Service Center for information on plug adapters for overseas use.

Playback on a TV Screen

You can only play back your recordings on TVs with PAL system. The PAL system is used in the following countries/areas:

Algeria, Australia, Austria, Bangladesh, Belgium, Brunei, China, Denmark, Finland, Germany, Hong Kong Special Administrative Region, Iceland, India, Indonesia, Ireland, Italy, Jordan, Kenya, Kuwait, Liberia, Malaysia, Malta, Mozambique, the Netherlands, New Zealand, North Korea, Norway, Oman, Pakistan, Portugal, Qatar, Serbia and Montenegro, Sierra Leone, Singapore, South Africa, Spain, Sri Lanka, Swaziland, Sweden, Switzerland, Tanzania, Thailand, Turkey, Uganda, United Arab Emirates, United Kingdom, Yemen, Zambia.

Troubleshooting

If you have a problem with your camcorder, refer to this checklist. Consult your dealer or a Canon Service Center if the problem persists.

Power Source

Problem	Cause	Solution	🕮
Camcorder will not turn on.	Battery pack is exhausted.	Replace or charge the battery pack.	12
	Battery pack is not correctly attached.	Attach the battery pack correctly.	12
The camcorder switches off by itself.	Battery pack is exhausted.	Replace or charge the battery pack.	12
	Power save function has been activated.	Turn on the camcorder.	22
Cassette compartment will not open.	Battery pack is exhausted.	Replace or charge the battery pack.	12
	Cassette compartment cover is not fully open.	Open the cassette compartment cover fully.	15
Cassette compartment stopped during loading/ unloading.	Battery pack is exhausted.	Replace or charge the battery pack.	12
	The camcorder malfunctions.	Consult a Canon Service Center.	–
LCD/viewfinder switches on and off.	Battery pack is exhausted.	Replace or charge the battery pack.	12
Battery pack will not charge.	Battery packs will not charge outside the temperature range of 0 °C and 40°C.	Charge the battery pack in temperatures between 0 °C and 40 °C.	–
	Battery packs become hot with use and may not charge.	Wait until the battery pack temperature is below 40 °C and retry charging.	–
	The battery pack is damaged.	Use a different battery pack.	–

Recording/Playback

Problem	Cause	Solution	🕮
Buttons will not work.	Camcorder is not turned on.	Turn on the camcorder.	21
	Cassette is not loaded.	Load a cassette.	15
"" flashes on the screen.	Cassette is not loaded.	Load a cassette.	15
"" flashes on the screen.	Battery pack is exhausted.	Replace or charge the battery pack.	12
"" flashes on the screen.	Condensation is detected.	See reference page.	114
"REMOVE THE CASSETTE" appears on the screen.	Camcorder stopped operating to protect the tape.	Unload and reload the cassette.	15
The wireless controller will not work.	[WL.REMOTE] is set to [OFF].	Set [WL.REMOTE] to [ON].	67
	The battery of the wireless controller is exhausted.	Replace the battery.	17

Recording

Problem	Cause	Solution	🕮
Image will not appear on the screen.	Camcorder is not set to CAMERA · 📼 mode.	Set the camcorder to CAMERA · 📼 mode.	21
"SET THE TIME ZONE, DATE AND TIME" appears on the screen.	Time zone, date and time are not set.	Set the time zone, date and time.	19
	Backup battery is exhausted.	Replace the backup battery and reset the time zone, date and time.	14
	Backup battery is inserted the wrong way.	Insert the backup battery with the + side facing outward and set the time zone, date and time.	14
Pressing the start/stop button will not start recording.	Camcorder is turned off.	Turn on the power.	21
	Cassette is not loaded.	Load a cassette.	15
	Tape reached the end ("📼 **END**" flashes on the screen).	Rewind the tape or replace the cassette.	15
	Cassette is protected ("📼" flashes on the screen).	Change the position of the protect switch.	117
	Camcorder is set to a mode other than the CAMERA · 📼 mode.	Set the camcorder to CAMERA · 📼 mode.	21
Camcorder will not focus.	Autofocus does not work on that subject.	Focus manually.	46
	Viewfinder is not adjusted.	Adjust the viewfinder with the dioptric adjustment lever.	16
	Lens is dirty.	Clean the lens.	113
A vertical light bar appears on the screen.	Bright light in a dark scene may cause a vertical light bar (smear) to appear. This is not a malfunction.	– – –	–
Viewfinder picture is blurred.	Viewfinder is not adjusted.	Adjust the viewfinder with the dioptric adjustment lever.	16
Sound is distorted or recorded in a lower volume than the actual volume.	When recording near loud sound (such as fireworks, drums or concerts), sound may become distorted or may not be recorded in the actual sound level. This is not a malfunction.	– – –	–

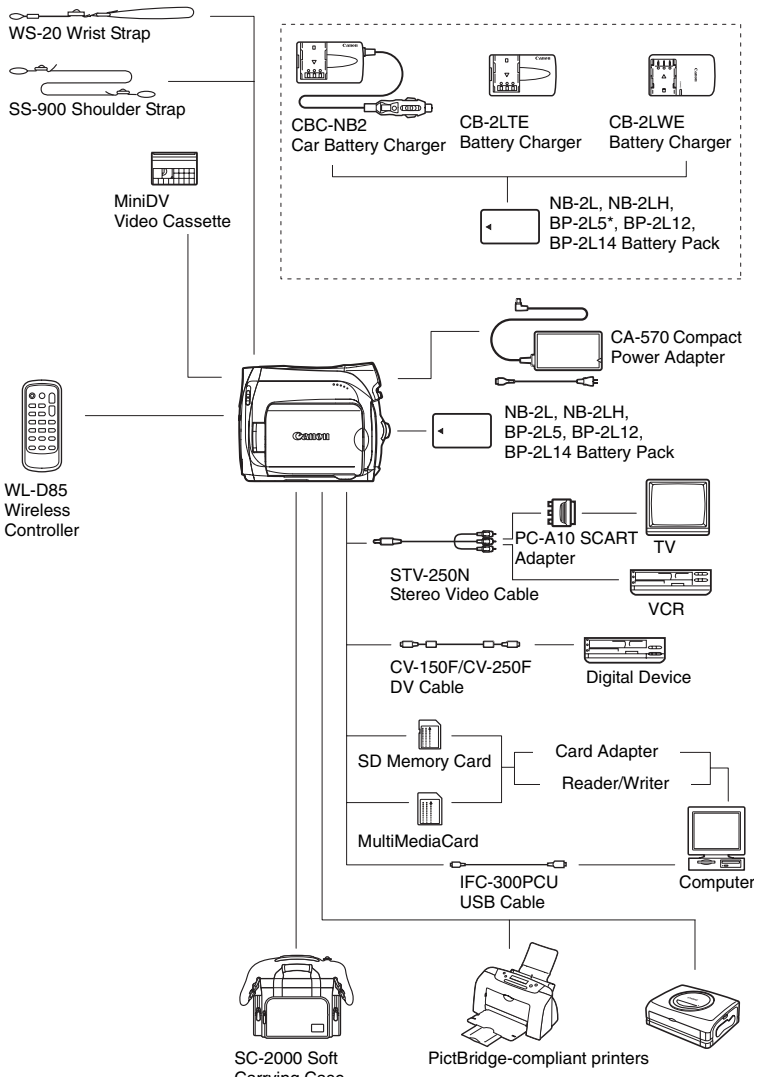
Playback

Problem	Cause	Solution	🕮
Pressing the playback button does not start playback.	Camcorder is turned off, or is not set to PLAY · 📼 mode.	Set the camcorder to PLAY · 📼 mode.	29
	The TAPE/CARD switch is set to CARD.	Set the TAPE/CARD switch to TAPE.	29
	Cassette is not loaded.	Load a cassette.	15
	Tape reached the end ("📼 **END**" flashes on the screen).	Rewind the tape.	29
Image will not appear on the TV screen.	*MV960* [AV ➡ DV] is set to [ON].	Set [AV ➡ DV] to [OFF].	76
Tape is running, but image will not appear on the TV screen.	TV/VIDEO selector on the TV is not set to VIDEO.	Set the selector to VIDEO.	32
	Video heads are dirty.	Clean the video heads.	114
	You attempted to play back or dub copyright protected tape.	Stop playback/dubbing.	–
No sound from the built-in speaker.	Speaker volume is turned off.	Adjust the volume with the [SPEAKER VOLUME] option of the [AUDIO SETUP] menu.	31

Memory Card Operation

Problem	Cause	Solution	🕮
Memory card cannot be inserted.	Memory card was not facing the correct direction.	Turn the memory card over and reinsert it.	81
Memory card cannot be recorded.	Memory card is full.	Replace the memory card or erase images.	81, 95
	Memory card is not initialized.	Initialize the memory card.	96
	Memory card is not inserted.	Insert a memory card.	81
	File number reached maximum value.	Set [FILE.NOS.] to [RESET] and insert a new memory card.	84
	SD Memory Card is protected.	Change the position of the protect switch.	81
Memory card cannot be played back.	Camcorder is not set to PLAY · 🖼 mode.	Set the camcorder to PLAY · 🖼 mode.	92
	Memory card is not inserted.	Insert a memory card.	81
Image cannot be erased.	Image is protected.	Cancel the protection.	94
	SD memory card is protected.	Change the position of the protect switch.	81
"🖼" flashes red.	Card error occurred.	Turn off the camcorder. Remove and reinsert the memory card. Initialize the memory card if flashing persists.	96

System Diagram (Availability differs from area to area)



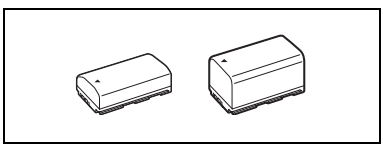
* The BP-2L5 is not available as a separate optional accessory.

Optional Accessories

Use of genuine Canon accessories is recommended.
This product is designed to achieve excellent performance when used with genuine Canon accessories. Canon shall not be liable for any damage to this product and/or accidents such as fire, etc., caused by the malfunction of non-genuine Canon accessories (e.g., a leakage and/or explosion of a battery pack). Please note that this warranty does not apply to repairs arising out of the malfunction of non-genuine Canon accessories, although you may request such repairs on a chargeable basis.

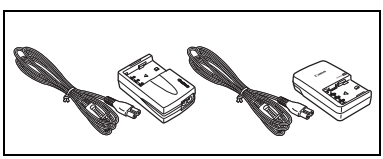
Battery Packs

When you need extra battery packs, select from the following: NB-2L, NB-2LH, BP-2L12, BP-2L14.



CB-2LTE/CB-2LWE Battery Charger

Use the battery charger for charging the battery packs.

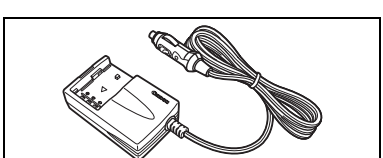


Battery Pack	Charging Time
BP-2L5	70 min.
NB-2L	80 min.
NB-2LH	90 min.
BP-2L12	150 min.
BP-2L14	170 min.

Charging time varies according to the charging condition.

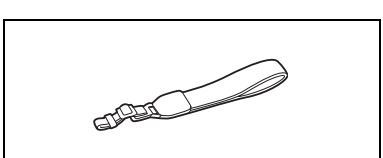
CBC-NB2 Car Battery Charger

Use the car battery charger to charge battery packs on the move. The car battery cable plugs into your car's cigarette lighter and runs off a 12-24 V DC negative ground battery.



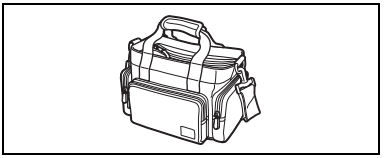
WS-20 Wrist Strap

Use this for extra additional protection for active shooting.



SC-2000 Soft Carrying Case

A handy camcorder bag with padded compartments and plenty of space for accessories.



This mark identifies genuine Canon video accessories. When you use Canon video equipment, we recommend Canon-brand accessories or products bearing the same mark.

MV960/MV950/MV940/MV930

System

Video Recording System	2 rotary heads, helical scanning DV system (consumer digital VCR SD system), digital component recording
Audio Recording System	PCM digital sound: 16 bit (48 kHz/2 ch); 12 bit (32 kHz/4 ch)
Television System	EIA standard (625 lines, 50 fields) PAL color signal
Image Sensor	1/6-inch CCD, approx. 800,000 pixels Effective pixels: Tape: 16:9 (with image stabilizer): approx. 470,000 16:9 (no image stabilizer): approx. 530,000 4:3 recording: approx. 400,000 Card (still images): approx. 530,000
Tape Format	Videocassettes bearing the “MiniDV” mark.
Tape Speed	SP: 18.83 mm/s, LP: 12.57 mm/s
Maximum Recording Time (80 min. cassette)	SP: 80 min., LP: 120 min.
Fast Forward/Rewind Time	Approx. 2 min. 20 sec. (with a 60 min. cassette)
LCD Screen	2.7-inch. wide, TFT color, approx. 112,000 pixels
Viewfinder	0.3-inch. TFT color, approx. 123,000 pixels
Microphone	Stereo electret condenser microphone
Lens	f=2.6-65 mm, F/1.8-4.4, 25x power zoom 35 mm equivalent: Tape: 16:9 (with image stabilizer): 43.6-1090 mm 16:9 (no image stabilizer): 41.0-1025 mm 4:3 recording: 49.8-1245 mm Card (still images): approx. 43.6-1090 mm
Lens Configuration	10 elements in 8 groups
AF System	TTL autofocus, manual focusing possible
Minimum Focusing Distance	1 m; 1 cm on maximum wide angle
White Balance	Auto white balance, pre-set white balance (DAYLIGHT, TUNGSTEN) or custom white balance
Minimum Illumination	2.0 lx (Night recording program, shutter speed at 1/6)
Recommended Illumination	More than 100 lx
Image Stabilization	Electronic

Memory Card

Recording Media	SD Memory Card, MultiMediaCard*
Size of Images on the Card	Still image: 1024 x 768, 640 x 480 pixels Movie: 320 x 240, 160 x 120 pixels, 12.5 frames/sec.
File Format	Design rule for Camera File System (DCF), Exif 2.2** compliant, DPOF compliant
Image Compression Method	Still image: JPEG (compression: Super Fine, Fine, Normal) Movie: Video data: Motion JPEG, audio data: WAVE (monaural)

* The camcorder's operations have been tested with SD memory cards up to 2GB. Performance cannot be guaranteed for all memory cards.

** This camcorder supports Exif 2.2 (also called “Exif Print”). Exif Print is a standard for enhancing the communication between camcorders and printers. By connecting to an Exif Print-compliant printer, the camcorder’s image data at the time of shooting is used and optimized, yielding extremely high quality prints.

Input/Output Terminals

AV Terminal	Ø3.5 mm minijack, output only (MV960 : input/output) Video: 1 Vp-p/75 ohms unbalanced Audio output: –10 dBV (47 kohm load)/3 kohms or less MV960 Audio input: –10 dBV/40 kohms or more
DV Terminal	Special 4-pin connector (IEEE 1394 compliant) MV960/MV940 Input/Output MV950/MV930 Output only
USB Terminal	mini-B

Power/Others

Power supply (rated)	7.4 V DC
Power consumption (AF on)	2.4W (using viewfinder), 2.5 W (using LCD screen in normal brightness)
Operating temperature	0 – 40 °C
Dimensions (W x H x D)	49 x 92 x 115 mm excluding protrusions
Weight (camcorder body only)	380 g

CA-570 Compact Power Adapter

Power supply	100 – 240 V AC, 50/60 Hz
Power consumption	17W
Rated output	8.4 V DC, 1.5 A
Operating temperature	0 – 40 °C
Dimensions	52 x 90 x 29 mm
Weight	135 g

MV960/MV950 NB-2LH Battery Pack

Battery type	Rechargeable Lithium Ion Battery
Rated voltage	7.4 V DC
Operating temperature	0 – 40 °C
Battery capacity	720 mAh
Dimensions	33.3 x 16.2 x 45.2 mm
Weight	43g

MV940/MV930 BP-2L5 Battery Pack

Battery type	Rechargeable Lithium Ion Battery
Rated voltage	7.4 V DC
Operating temperature	0 – 40 °C
Battery capacity	530 mAh
Dimensions	33.3 x 16.2 x 45.2 mm
Weight	40 g

Weight and dimensions are approximate. Errors and omissions excepted. Subject to change without notice.

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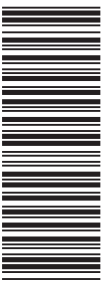
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